**University of Management and Technology**

**Course Outline**

Course code……EE 110………………… Course title……Linear Circuit Analysis……………………

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| --- | --- |
| Program | BSEE |
| Credit Hours | 3 |
| Duration | One semester |
| Prerequisites | nil |
| Resource Person | Khan M. Nazir |
| Counseling Timing(Room#Project Lab ) | 11 to 12 noon and 2 pm to 4pm , Monday & Wednesday12 noon am to2 pm, Tuesday & Thursday |
| 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:-

1. Calculate the voltage and current in simple resistive networks containing dependent and independent sources by applying a variety of techniques, such as nodal analysis, mesh analysis, source transformation, superposition, and Thevenin’s and Norton’s equivalent circuits.
2. Determine natural, forced and step response of RL, RC, and RLC circuits
3. Solve circuit problems containing operational amplifier.

**Learning Methodology:**

Lecture, interactive, participative

**Grade Evaluation Criteria**

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

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| --- | --- | --- |
| **Marks Evaluation** |  | **Marks in percentage** |
| Quizzes  |  | 16  |
| Assignments/project  |  | 9 |
| Mid Term |  | 25 |
| Final exam  |  | 50 |
| Total |  | 100 |

**Recommended Text Books:**

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

**Reference Books:**

1)Basic Engineering Circuit Analysis, 8t h Ed., By J. David Irwin, John Wiley & Sons

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

3) Fundamental of electric circuits by Floyd

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

**Course code……………………………...... Course title………………………………………**

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| --- | --- | --- |
|  **Week** |  **Course Contents**  | **Reference Chapter(s)** |
|  1 | 1.1 Electrical Engineering: An Overview1.2 The International System of Units1.3 Charge and Current1.4 Voltage 1.5 Power and Energy1.6 Circuit Element | Ch-1 |
|  2 | 2.1 Introduction to Basic Laws2.2 Ohm’s Law2.3 Nodes , Branches, Loops2.4 Kirchoff’s Laws2.5 Series Resistors and Voltage Division | Ch-2 |
|  3 | 2.6 Parallel Resistors & Current Division2.7 Wye-Delta Transformation | Ch-2 |
|  4 | 3.1 Introduction to Methods of Analysis3.2 Nodal Analysis3.3 Nodal Analysis with Voltage Source | Ch-3  |
|  5 | 3.4 Mesh Analysis3.5 Mesh Analysis with Current Source3.7 Nodal Versus Mesh Analysis | Ch-3  |
|  6 | 4.1 Introduction to Circuit Theorems4.2 Linearity Property4.3 Superposition4.4 Source Transformation | Ch-4  |
|  7 | 4.5 Thevenin’s Theorem4.6 Norton’s Theorem4.7 Derivations of Thevenin’s and Norton’s Theorem | Ch-4  |
|  8 | **Mid Term Examination** |  |
|  9 | 4.8 Maximum Power Transfer4.9 Source Transformations | Ch-4  |

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|  10 | 5.1 Introduction to Operational Amplifier5.2 Operational Amplifier5.3 Ideal Op Amp5.4 Inverting Amplifier5.5 Non-inverting Amplifier5.6 Summing Amplifier5.7 Difference Amplifier | Ch-5  |
|  11 | 6.1 Introduction to Capacitors and Inductors6.2 Capacitors6.3 Series and Parallel Capacitors6.4 Inductors6.5 Series and Parallel Inductors | Ch-6 |
|  12 | 7.1 Introduction to First-Order Circuits7.2 The Source-Free RC Circuit7.3 The Source-Free RL Circuit | Ch-7 |
|  13 | 7.4 Singularity Functions7.5 Step Response of an RC Circuit7.6 Step Response of an RL Circuit | Ch-7 |
|  14 | * 1. Introduction to Second-Order Circuits
	2. Finding Initial and Final Values
	3. The Source Free Series RLC Circuit

8.4 The Source Free Parallel RLC Circuit | Ch-8 |
|  15 | 8.5 Step response of a Series RLC Circuit8.6 Step response of a Parallel RLC Circuit8.7 General Second-order circuit  | Ch-8 |