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| **logoUniversity of Management & Technology**School of Science & TechnologyDepartment of Electrical Engineering |
| EE223 Electrical Network Analysis |
| **Lecture Schedule** | Mon, Wed 10:40 -12:00 (Sec A)2Tue 10:40 - 12:00 (Sec B)1 Mon, Wed 12:00 -13:20 (Sec C)2Tue, Thu 09:20-10:40 (Sec D)1 | **Semester** | Fall 2012 |
| **Pre-requisite** | EE-111 Circuit Analysis | **Credit Hours** | 3+1 |
| **Instructor(s)** |  Rauf Ali1(Sec B,D) Farhan Iqbal2 (Sec A,C) | **Contact** |  rauf.ali@umt.edu.pk1  farhan.iqbal@umt.edu.pk2 |
| **Office** | (C-3/14)1, (C-3/1)2  | **Office Hours** | See office window  |
| **TA** | None | **Contact** | N/A |
| **Office** | N/A | **Office Hours** | N/A |
| **Course Description** |

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|  This course is a continuation of Circuits I. It covers following topics. Steady-State analysis of AC circuits; AC Power analysis and concept of complex power; Single phase and three phase systems; Magnetically coupled circuits and ideal transformer; Transient response of second order circuits and frequency response of circuits; The Laplace Transform and Circuit Analysis using Laplace Transform. Fourier analysis and Two port networks.  |

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| **Expected Outcomes** |

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| In accordance with HEC curriculum outcomes a, b, d, e, g, h & i, students at the end of the course should be able to * Understand the effect of alternating Sources on different circuit elements.
* Calculate average, real and complex powers
* Solve circuits by applying Phasor and Laplace and Fourier transforms
* Analyze balanced three phase systems
* Analyze two port networks
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| **Textbook(s)** | **Recommended Text**: Fundamentals of Electric Circuits,4th ed., by Alexander and Sadiku**Reference**: Network Analysis,3rd ed., by M.E. Van Valkenburg |
| **Grading Policy** | * Homework & Quizzes : 20% (All Announced)

All quizzes will be announced. Quizzes will be 10-15 minutes. * Midterm : 20%

60-70 minute exam. All topics covered before the midterm exam will be included.* Labs: 20 %
* Final : 40%, 120-150 minute exam. Will be comprehensive
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| **Lecture** | **Topics** | **Textbook (TB) /****Reference (Ref) Readings** |
| 1-3 | Sinusoids, Phasors, Phasor Relationships for Circuit Elements, Impedance & Admittance  | TB: 9.2-9.5 |
| 4 | Kirchoff’s laws in frequency domain, Impedance Combinations  | TB: 9.6-9.7 |
| 5,6 | Sinusoidal steady state analysis introduction, Nodal Analysis, Mesh Analysis | TB: 10.1-10.2 |
| 7,8 | Superposition Theorem, Source Transformation | TB: 10.3-10.4 |
| 9-10 | Thevenin and Norton Equivalent Circuits | TB:10.5-10.6 |
| 11,12 | Instantaneous Power, Average and Reactive power,  | TB:11.1-11.2 |
| 13 | Maximum average power transfer, Effective or rms Value  | TB:11.3-11.4 |
| 14 | Apparent Power and Power Factor, Complex power  | TB:11.5-11.6 |
| 15-17 | Mutual Inductance, Linear Transformers | TB:13.2-13.4 |
| 18,19 | Definition of Laplace transform, Properties of the laplace transform | TB:15.1-15.3 |
| 20 | The Inverse Laplace Transform, Circuit Elements in s-domain, Circuit analysis in s-domain | TB:15.4,16.2-16.3 |
| 21,22 | The transfer function, The transfer function in partial fractions,  | TB: 16.4 |
| 23-25 | Balanced Three-Phase Voltages, Analysis of the Wye-Delta Circuit, Analysis of the Wye-Wye Circuit , Analysis of the Delta-Wye Circuit, Analysis of the Delta-Delta Circuit | TB: 12.1-12.6 |
| 26-28 | Frequency response, Low-Pass Filters, High-Pass Filters, Band pass Filters, Band stop Filters  | TB: 14.2-14.7 |
| 29,30 | Impedance parameters, Admittance parameters, Hybrid parameters  | TB:19.1-19.4 |
|  | **Final** |  |

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 **Course Schedule**