



**University of Management & Technology**  
 School of Science & Technology  
 Department of Electrical Engineering

**EL209 Electronics Devices and Circuits Lab**

<b>Lab Schedule</b>	Tues, Thurs, Fri, Sat: 08:00 – 11:00 Tues, Thurs, Fri, Sat: 11:00 – 14:00 Fri, Sat: 15:30 – 18:30	<b>Semester</b>	Spring 2013
<b>Pre-requisite</b>	EE-111 Circuit Analysis	<b>Credit Hours</b>	1
<b>Instructor(s)</b>	Khalid Ejaz (Sec A, A1, B, B1, D) <sup>[1]</sup> Fahimullah Khanzada (Sec C, D1, E1) <sup>[3]</sup> Muhammad Arif Saeed (Sec C1) <sup>[4]</sup> Salman Khaliq (Sec E) <sup>[5]</sup>	<b>Contact</b>	khalid.ijaz@umt.edu.pk <sup>[1]</sup> fahim.khanzada@umt.edu.pk <sup>[3]</sup> arif.saeed@umt.edu.pk <sup>[4]</sup> salman.khaliq@umt.edu.pk <sup>[5]</sup>
<b>Office</b>	Ground Floor, Signals Lab <sup>[1]</sup> Ground Floor, Electrical Machines Lab <sup>[3]</sup> Ground Floor, Workshop Lab <sup>[4]</sup>	<b>Office Hours</b>	See office window
<b>Lab Description</b>	<p>The lab deals with fundamental and practical aspect of Electronic Devices and Circuits. It is designed to practically implement and observe the characteristics of Diodes, BJTs, MOSFETs ,Operational Amplifiers and their circuit applications. Simulations will also be part of the lab experiments. The students will be required to prepare their own lab copies. Assessments based on designing and testing will be carried in mid-term and final to evaluate students’ understanding.</p> <p>The Lab directly contributes to <b>objectives</b> a, d, e and f of the HEC Electrical Engineering Curriculum.</p>		
<b>Expected Outcomes</b>	<p>Upon completion of this lab, students will:</p> <ul style="list-style-type: none"> <li>• Have good understanding of basic electronics devices like diodes, transistors, and Op-Amps.</li> <li>• Be able to analyze and design electronic circuits</li> <li>• Be able to design electronic circuits to meet given specifications</li> <li>• The Lab strongly supports expected <b>outcomes</b> a, d, f, i, l and m of the HEC Electrical Engineering Curriculum.</li> </ul>		
<b>Book(s)</b>	<p><b>Recommended Text Book:</b> Laboratory Manual supplied by the instructor</p> <p><b>Reference Books:</b></p>		

	<ul style="list-style-type: none"> <li>✓ Electronic Devices &amp; Circuit Theory - Lab Manual, Robert L. Boylestad, Louis Nashelsky</li> <li>✓ Electronic Devices, Thomas L. Floyd, 6th Edition</li> <li>✓ Microelectronic Circuits, A.S. Sedra and K.C. Smith, 6th Edition,</li> <li>✓ Electronic Devices and Circuit Theory, Robert L. Boylestad, Louis Nashelsky, 10<sup>th</sup> Edition</li> </ul>
<b>Grading Policy</b>	<ul style="list-style-type: none"> <li>• Lab Grading : 40%</li> <li>• Project : 40%</li> <li>• Final Evaluation : 20%</li> </ul>

## LAB Schedule

LAB	Topic
1	Diode V-I Characteristics
2	Series and Parallel Diode Configurations
3	Half Wave Full Wave Rectifier Power supply design
4	Clipping Circuit Clamping Circuit
5	Light Emitting Diode Zener Diode as clipper and voltage regulator
6	BJT V-I Characteristics
7	Fixed and Voltage Divider Bias Circuits of BJTs

8	Emitter and Collector Feedback Bias Circuits of BJTs
9	Common Emitter Amplifier Design
10	VI characteristics of FET
11	Differential Amplifier Design Op Amp as Buffer, Averaging Amplifier, Integrator and Differential Amplifier
12	A/D and D/A converter design using Operational Amplifier
13	Using Operational Amplifier for Low Pass, High Pass , Band Pass and Band Stop filter designs
14	Project Presentations and Evaluation