

<b>SEMESTER</b>	<b>DEPARTMENT</b>	<b>COURSE TITLE</b>
<i>Fifth</i>	<i>Telecommunications Engineering</i>	<i>Analog Electronics III Lab.</i>
<b>COURSE CODE</b>	<b>HOURS 3</b>	<b>COURSE SPECIFICATIONS</b>
<i>ET503</i>	<b>UNITS 1</b>	<i>Practical Content</i>
<p><b>1. Build and Test Passive and Active Filters using operational amplifier:</b></p> <ul style="list-style-type: none"> <li>➤ Measuring and plotting the frequency response of RC-LPF and HPF</li> <li>➤ Determining the cut-off frequencies.</li> <li>➤ Measuring and plotting the frequency response of second-order LP and HP active filters.</li> <li>➤ Determining the cut-off frequencies of the second order filters.</li> <li>➤ Measuring and plotting the frequency response of band pass filter and band reject filter.</li> </ul>		
<p><b>2. Waveform Generator and Sinusoidal Oscillator Circuits using operational amplifier:</b></p> <ul style="list-style-type: none"> <li>➤ Building and testing phase shift oscillator.</li> <li>➤ Investigation of the relationship between amplitude, frequency and circuit components of the generated sine wave.</li> <li>➤ Building and testing Wein-bridge oscillator.</li> <li>➤ Building and testing Colpitts oscillator.</li> <li>➤ Building and testing a crystal oscillator, a square wave generator and triangular generator.</li> </ul>		
<p><b>3. Phase-Locked Loop (PLL):</b></p> <ul style="list-style-type: none"> <li>➤ Using PLL in voltage to frequency conversion.</li> <li>➤ Using PLL in frequency to voltage conversion.</li> </ul>		
<p><b>4. Voltage Regulators and Switched-Mode Power Supplies:</b></p> <ul style="list-style-type: none"> <li>➤ Building and testing voltage regulator built from discrete transistors.</li> <li>➤ Building and testing voltage regulator built from operational amplifier.</li> <li>➤ Testing integrated circuit voltage regulator.</li> </ul>		
<p><b>5. Semiconductor Switches:</b></p> <ul style="list-style-type: none"> <li>➤ Testing and using a Schottky diode in a relaxation oscillator and vary its frequency of oscillation.</li> </ul>		

- Testing a typical Thyristors circuit.
- Building and testing an over voltage protection circuit that uses Thyristors.

**References:**

1. Ronald J. Tocci, *Fundamentals of Electronic Devices*, Charles E. Merrill Publishing.
2. Theodore F. Bogart, *Electronic Devices and Circuits*, Prentice-Hall.
3. Ralph J. Smith, *Circuits, Devices and Systems*, John Wiley.
4. Jacob Millman and Arvin Grabel, *Microelectronics*, McGraw Hill.
5. Micheal Jacob, *Applications and Design with Analog Integrated Circuits*, Prentice Hall.
6. أساسيات الالكترونيات، تأليف: أي إن لورج، تعريب معن محمد شاکر .
7. Paul B. Zbar, *Basic Electronics*, McGraw-Hill Book Company.
8. Paul B. Zbar, *Industrial Electronics; A text-lab manual*, McGraw-Hill book company
9. Horwitz and Robinson, *Laboratory manual for the art of electronics*, Cambridge University Press.
10. Phillip Cutler, *Linear Electronic Circuits with Illustrative Problems*, McGraw-Hill Inc.