

**COURSE ELT2050: ELECTRONIC POWER SUPPLY 2****Level:** Intermediate**Theme:** Power Systems**Prerequisite:** ELT1050 Electronic Power Supply 1**Description:** Students construct and demonstrate the fundamentals of electronic power supply technology.**Parameters:** Oscilloscope, multimeter, isolation transformer and related resources.**Supporting Course:** ELT2010 Electro-assembly 2**Curriculum and Assessment Standards**

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>construct, analyze and evaluate single-phase rectifiers</li> <li>observe and test the voltage and waveform of a switching power supply</li> <li>build and analyze the characteristics of a power supply regulated by a zener transistor</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>constructing, analyzing and evaluating various single-phase rectifier systems such as:               <ul style="list-style-type: none"> <li>half-wave rectifier circuit</li> <li>two-diode rectifier circuit</li> <li>bridge rectifier circuit.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>ELTLAB–2: Assessment Checklist: Laboratory Practice, Parts 2 and 3</i></p> <p><i>Standard</i>  <i>Performance rating of 2 for each applicable task</i></p>	25
	<ul style="list-style-type: none"> <li>identification of components and circuits using a schematic diagram and testing the voltage and waveform of a switching power supply.</li> </ul> <p><i>Assessment Tool</i>  <i>ELTLAB–2: Assessment Checklist: Laboratory Practice, Part 3</i></p> <p><i>Standard</i>  <i>Performance rating of 2 for each applicable task</i></p>	10
	<ul style="list-style-type: none"> <li>identifying components/circuits using a schematic then building and analyzing a regulated power supply.</li> </ul> <p><i>Assessment Tool</i>  <i>ELTLAB–2: Assessment Checklist: Laboratory Practice, Part 2</i></p> <p><i>Standard</i>  <i>Performance rating of 2 for each applicable task</i></p>	30

**COURSE ELT2050: ELECTRONIC POWER SUPPLY 2 (continued)**

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>• build, test and analyze filtering circuits used in electronic power supplies</li> <li>• demonstrate established laboratory procedures and safe work practices</li> <li>• demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• identifying components/circuits using a schematic then building and analyzing an electronic regulated power supply filter circuits.</li> </ul> <p><i>Assessment Tool</i>  <i>ELTLAB–2: Assessment Checklist: Laboratory Practice, Part 2</i></p> <p><i>Standard</i>  <i>Performance rating of 2 for each applicable task</i></p> <ul style="list-style-type: none"> <li>• observed performance in following:               <ul style="list-style-type: none"> <li>– established laboratory procedures</li> <li>– correct procedures for grounding and use of oscilloscope.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>ELTPSP: Assessment Checklist: Laboratory Procedures and Safety Practices</i></p> <p><i>Standard</i>  <i>Performance rating of 2 for each applicable task</i></p> <ul style="list-style-type: none"> <li>• observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>30</p> <p>5</p> <p>Integrated throughout</p>

Concept	Specific Outcomes	Notes
<p>Safety/Resource Management</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• use an isolation transformer</li> <li>• demonstrate safe practices, especially regarding grounding and use of oscilloscope.</li> </ul>	

**COURSE ELT2050: ELECTRONIC POWER SUPPLY 2 (continued)**

Concept	Specific Outcomes	Notes
Fundamentals	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• identify components responsible for improved output of a regulated filtered power supply</li> <li>• explain fundamentals of diodes, zeners, transistors and operational amplifiers (OP amps)</li> <li>• diagram half-wave, full-wave bridge and centre tap rectifiers</li> <li>• identify current path in half-wave, full-wave bridge, and centre tap rectifiers.</li> </ul>	
Applied Mathematics	<ul style="list-style-type: none"> <li>• mathematically analyze output voltage, ripple frequency and required peak inverse voltage of half-wave, full-wave bridge and centre tap rectifiers</li> <li>• mathematically determine component values for construction of a regulated power supply.</li> </ul>	<p>Introductory trigonometry.</p> <p>Introductory algebra.</p>
Designing and Prototyping	<ul style="list-style-type: none"> <li>• construct, energize, measure and graph the input and output of a half-wave, full-wave bridge, centre tap rectifiers and regulated power supply.</li> </ul>	<p>Permanent construction on PC board made in ELT2010.</p> <p>Zener, IC, op-amps, transistor regulated.</p>
Stages of Operation	<ul style="list-style-type: none"> <li>• set up, test and analyze a switching power supply.</li> </ul>	<p>Test existing power supply.</p>
Fabricating/Testing	<ul style="list-style-type: none"> <li>• construct a full-wave, filtered and regulated power supply</li> <li>• test regulated power supply.</li> </ul>	<p>Can be linked to Electro-assembly 3 (ELT3010).</p>

