

ADVANCED DIPLOMA OF BIOMEDICAL ENGINEERING

MODULE DETAILS	MODULE 7: POWER ELECTRONICS AND POWER SUPPLIES
	<p>Nominal duration: 4 weeks (48 hours total time commitment)</p> <p>This time commitment includes the preparation reading, attendance at each webinar (1 hour plus 15-30 minutes for discussion), and the time necessary to complete the assignments and further study.</p>
MODULE PURPOSE	To provide participants with a detailed examination of general power supply concepts ranging from simple unregulated, to a more sophisticated linear or switched-mode power supply and to equip them with the necessary skills to design and troubleshoot power supply systems.
PRE-REQUISITES MODULE, UNITS / CO-REQUISITES	Nil
ASSESSMENT STRATEGY	To evaluate the achievement of the learning outcomes; written assignments, group projects and practical exercises are set.
SUMMARY OF LEARNING OUTCOMES	<ol style="list-style-type: none"> 1. Examine and discuss basic power supply concepts, topologies, and controllers 2. Outline the power supply input section design and power transistor attributes 3. Discuss issues related to high-frequency transformers, output section design, and SMPS stability 4. Examine and discuss noise considerations, power supply electrical safety standards, and heat-sinking
Learning Outcome 1	Examine and discuss basic power supply concepts, topologies, and controllers
Assessment Criteria	<ol style="list-style-type: none"> 1.1 Examine and discuss basic power supply concepts 1.2 Select an appropriate topology for a power supply 1.3 Describe the salient attributes of PWM controllers

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Learning Outcome 2	Outline the power supply input section design and power transistor attributes
Assessment Criteria	<p>2.1 Describe the component selection and design criteria for power supply input sections</p> <p>2.2 Select appropriate power transistors for a given power supply design</p>
Learning Outcome 3	Discuss issues related to high-frequency transformers, output section design, and SMPS stability
Assessment Criteria	<p>3.1 Design a high-frequency transformer for an SMPS</p> <p>3.2 Design the output section for an SMPS</p> <p>3.3 Discuss the issues affecting stability in an SMPS</p>
Learning Outcome 4	Examine and discuss noise considerations, power supply electrical safety standards, and heat-sinking
Assessment Criteria	<p>4.1 Examine and discuss EMI-RFI considerations in switch mode power supplies</p> <p>4.2 Discuss safety standards related to power supplies</p> <p>4.3 Select/design an appropriate heat-sink for a given power supply</p>
Delivery Mode	
<p>A combination of asynchronous and synchronous e-learning delivery comprising a judicious mix of interactive online web conferencing, simulation (virtual labs) software, remote online labs, online videos, PowerPoints, notes, reading and study materials (in pdf, html and word format) accessed through the Moodle Learning Management System (LMS).</p>	