

## ADVANCED DIPLOMA OF BIOMEDICAL ENGINEERING

<b>MODULE DETAILS</b>	<b>MODULE 8: SHIELDING, EMC/EMI, NOISE REDUCTION AND GROUNDING/EARTHING</b>
	<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>
<b>MODULE PURPOSE</b>	To equip the participants with the necessary skills to identify, design, prevent and fix common EMC/EMI problems, with focus on grounding/earthing and shielding techniques.
<b>PRE-REQUISITES MODULE, UNITS / CO-REQUISITES</b>	Nil
<b>ASSESSMENT STRATEGY</b>	To evaluate the achievement of the learning outcomes; written assignments, group projects and practical exercises are set.
<b>SUMMARY OF LEARNING OUTCOMES</b>	<ol style="list-style-type: none"> <li>1 Examine and discuss EMI/EMC concepts, EM principles, shielding and grounding</li> <li>2 Examine and discuss noise issues related to cables, connectors, circuits and components</li> <li>3 Examine and discuss circuit protection, filtering and engineering measurements</li> <li>4 Examine and discuss power supplies and EMC Engineering management</li> </ol>
<b>Learning Outcome 1</b>	<b>Examine and discuss EMI/EMC concepts, EM principles, shielding and grounding</b>
<b>Assessment Criteria</b>	<ol style="list-style-type: none"> <li>1.1 Examine basic EMI/EMC concepts</li> <li>1.2 Discuss basic EM principles pertaining to noise management</li> <li>1.3 Outline the basic procedures for proper shielding</li> <li>1.4 Outline the basic approaches for providing proper earthing and grounding</li> </ol>

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<b>Learning Outcome 2</b>	<b>Examine and discuss noise issues related to cables, connectors, circuits and components</b>
<b>Assessment Criteria</b>	<p>2.1 Discuss the noise-related attributes of cables and connectors</p> <p>2.2 Examine noise-related issues related to circuits and components</p>
<b>Learning Outcome 3</b>	<b>Examine and discuss circuit protection, filtering and engineering measurements</b>
<b>Assessment Criteria</b>	<p>3.1 Discuss the basics of circuit protection and filtering</p> <p>3.2 Describe the procedures for taking Engineering measurements</p>
<b>Learning Outcome 4</b>	<b>Examine and discuss power supplies and EMC Engineering management</b>
<b>Assessment Criteria</b>	<p>4.1 Examine the contribution of power supplies and their components to noise in circuits</p> <p>4.2 Discuss the concept and implementation of EMC Engineering management</p>
<b>Delivery Mode</b>	
<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>	