

ADVANCED DIPLOMA OF BIOMEDICAL ENGINEERING

MODULE DETAILS	MODULE 15: BIOMEDICAL EQUIPMENT AND ENGINEERING PRACTICES
	<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	<p>To provide the participants with a detailed overview of the principles and operation of biomedical equipment, provide a basic understanding of safety standards and medical equipment certification regulations and requirements.</p>
PRE-REQUISITES MODULE, UNITS / CO-REQUISITES	<p>Module 1: Basic Electrical Engineering</p> <p>Module 3: Fundamentals of Professional Engineering</p> <p>Module 6: Anatomy and Physiology for Engineering</p> <p>Module 7: Power Electronics and Power Supplies</p> <p>Module 8: Shielding, EMC/EMI, Noise Reduction and Grounding/Earthing</p> <p>Module 9: Troubleshooting Electronic Components and Circuits</p> <p>Module 10: Biomedical Instrumentation</p> <p>Module 12: Software Programming</p> <p>Module 13: Embedded Microcontrollers</p>
ASSESSMENT STRATEGY	<p>To evaluate the achievement of the learning outcomes; written assignments, group projects and practical exercises are set.</p>
SUMMARY OF LEARNING OUTCOMES	<ol style="list-style-type: none"> 1. Examine and discuss the characteristics and safety aspects of biomedical equipment 2. Examine and discuss the basic principles of equipment used for cardiac care and neurology 3. Examine and discuss the basic principles of clinical and laboratory equipment. 4. Examine and discuss the design and maintenance of medical equipment.

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Learning Outcome 1	Examine and discuss the characteristics and safety aspects of biomedical equipment.
Assessment Criteria	<p>1.1 Outline the characteristics of medical equipment.</p> <p>1.2 Examine the physiological effects of electrical currents.</p> <p>1.3 Examine the types of accidents in hospitals and laboratories.</p> <p>1.4 Describe the effects of micro and macro shocks.</p> <p>1.5 Discuss electrical hazards and the safety procedures in a biomedical environment</p> <p>1.6 Describe fundamental approaches to protect users from electrical shocks.</p> <p>1.7 Discuss international and local safety standards.</p>
Learning Outcome 2	Examine and discuss the basic principles of equipment used for cardiac care and neurology.
Assessment Criteria	<p>2.1 Examine and discuss the biomedical equipment used for :</p> <p>(a) Cardiac care</p> <p>(b) Neurological care</p>
Learning Outcome 3	Examine and discuss the basic principles of clinical and laboratory equipment.
Assessment Criteria	<p>3.1 Examine and discuss the equipment used for</p> <p>(a) Diathermy</p> <p>(b) Stimulation</p> <p>(c) Haemodialysis</p> <p>(d) Laboratory work</p> <p>(e) Therapeutic applications</p>
Learning Outcome 4	Examine and discuss the design and maintenance of medical equipment.
Assessment Criteria	<p>4.1 Examine and discuss the design of, and practices related to biomedical equipment</p> <p>4.2 Discuss the servicing and maintenance of biomedical equipment</p> <p>4.3 Examine future trends in biomedical equipment</p>

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Delivery Mode
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).