

ADVANCED DIPLOMA OF BIOMEDICAL ENGINEERING

MODULE DETAILS	MODULE 10: BIOMEDICAL INSTRUMENTATION
	<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 the participants with a detailed overview of the principles and operation of biomedical instrumentation and their applications.
PRE-REQUISITES MODULE, UNITS / CO-REQUISITES	<p>Module 1: Basic Electrical Engineering</p> <p>Module 6: Anatomy and Physiology for Engineering</p> <p>Module 7: Power Electronics and Power Supplies</p>
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 the principles and characteristics of biomedical instruments and biopotential signals 2. Examine the principles and applications of electrodes, sensors and transducers used for biomedical instrumentation 3. Examine and discuss the components of biomedical instrumentation 4. Examine and discuss the instruments for various body systems
Learning Outcome 1	Examine the principles and characteristics of biomedical instruments and biopotential signals
Assessment Criteria	<ol style="list-style-type: none"> 1.1 Examine and discuss the salient attributes of biomedical instruments 1.2 Examine and discuss the salient attributes of biopotential signals

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Learning Outcome 2	Examine the principles and applications of electrodes, sensors and transducers used for biomedical instrumentation
Assessment Criteria	<p>2.1 Examine and discuss sensors used for measuring various physiological parameters</p> <p>2.2 Compare the different types of electrodes used for acquiring biopotential signals</p> <p>2.3 Describe the application of biosensors and other sensors in various biomedical instruments</p> <p>2.4 Discuss the effects of artefacts and noise in biomedical instruments</p>
Learning Outcome 3	Examine and discuss the components of biomedical instrumentation
Assessment Criteria	<p>3.1 Examine and discuss the following components/subsystems of biomedical instrumentation:</p> <ul style="list-style-type: none"> (a) Power supplies (b) Signal conditioning (c) Amplifiers (d) Filters
Learning Outcome 4	Examine and discuss the instruments for various body systems
Assessment Criteria	<p>4.1 Examine and discuss the relevant instruments and their application in monitoring the following body systems:</p> <ul style="list-style-type: none"> (a) Skeletal and muscular (b) Cardiovascular (c) Respiratory (d) Nervous (e) Sensory
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>	