

1 Module Details

Module Name Technology Management

Nominal duration It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 36 to 40 hours.

Module code NUE921

Discipline code 0703230

2 Module purpose

This module aims to provide students with knowledge and skills to enable them work in a safe manner pursuant to the relevant Australian Standards, carry out preventative maintenance and functionally test common medical electronic equipment, communicate and document procedures and processes with management.

3 Prerequisites

nil

4 Relationship to competency standards

This module provides some of the knowledge and skills underpinning competency in the following standards: National Electrotechnology Industry Standards, Units NES304, NES406, NES504 and the relevant specialisation. Metals & Engineering Industry Standards, Units 18.56A, 18.57A, 18.58A, 18.65A, 18.66A.

5 Content

1. Standards
 - International
 - Australian
 - AS2500
 - AS3003
 - AS3200.1
 - AS2551
2. Electromedical treatment areas
 - Types
 - Testing
 - Protection
3. Electromedical equipment
 - Standards
 - Testing
4. Management
 - equipment
 - service contracts
 - product evaluation
 - clinical trial
 - user education
 - costs
 - calibration
 - safety testing
 - accreditation
- 5 Clinical trials
- 6 Contingency planning
 - Utilities
 - power

	<ul style="list-style-type: none"> - water - gases -communications • Documentation • Equipment • Procedures
6 Assessment strategy	
Assessment methods	Assessment should be progressive reflecting a holistic approach to ensure the module purpose is met. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests consisting of a number of item types, such as multiple choice, short answer and problem solving.
Conditions of assessment	Normally learning and assessment will take place in a classroom/laboratory.
7 Learning Outcome Details	
Learning Outcome 1	Describe the role of International and Australian Safety Standards in the design manufacture and on-going management of medical equipment.
Assessment criteria	<ol style="list-style-type: none"> 1.1 Describe the development of international and Australian Standards and the relationship between them. 1.2 Describe the structure and inter-relationship of Australian Standards. 1.3 Describe the legislative requirements for, and the implementation of, applicable Australian Standards.
Learning Outcome 2	Describe the requirements and procedures of Australian Standards AS2500.
Assessment criteria	<ol style="list-style-type: none"> 2.1 Describe the criteria for which AS2500 is most appropriately used. 2.2 List the clinical personnel who might derive benefit from this Standard.
Learning Outcome 3	Describe the application of AS3003 (1998) in the ongoing testing of Electromedical Treatment Areas.
Assessment criteria	<ol style="list-style-type: none"> 3.1 Describe the need for additional protective measures to be applied to reticulated 240V wiring in Electromedical Treatment Areas. 3.2 Describe the differing requirements of Cardiac-Protected and Body-Protected Areas. 3.3 List those Areas in a hospital most likely to need Cardiac Protection and the reasons.

	<p>3.4 List those areas in a hospital most likely to need Body Protection and the reasons.</p> <p>3.5 Describe the tests required for Body-Protected Areas</p> <p>3.6 Describe the action of an RCD and draw a circuit diagram of such a device.</p> <p>3.7 Describe the additional tests required for Cardiac-Protected Areas particularly where isolated supplies are installed.</p> <p>3.8 Describe the action of a Line Isolation Monitor and draw a simplified circuit diagram of such a device.</p> <p>3.9 List the specialised equipment required to carry out testing of both Cardiac and Body-Protected Areas.</p> <p>3.10 Describe the documentation necessary to show adequate verification of testing and the signage required of the areas so tested.</p>
Learning Outcome 4	Describe the application of AS3200.1 in the design of Electromedical Equipment and its use in providing rules for overall patient and operator safety.
Assessment criteria	<p>4.1 Describe the process of Type Testing in regard to AS3200.1.</p> <p>4.2 List the National Regulations in regard to AS3200.1 and the devices to which these regulations may apply.</p> <p>4.3 Describe important subsets of AS3200.1 (so-called Part 2 Standards).</p> <p>4.4 Describe the use of AS3200.1 in the tendering process.</p> <p>4.5 Describe the use of AS3200.1 as a legal document.</p> <p>4.6 Describe the use of 3200.1 as a reference document.</p>
Learning Outcome 5	Describe the content and applications of Australian Standards AS3551.
Assessment criteria	<p>5.1 Describe the relevance of AS3551 in hospital accreditation reviews.</p> <p>5.2 Describe the major differences between AS3551 and AS3200.1.</p> <p>5.3 Describe the Medical Device Management Program included in Section 2 of AS3551.</p> <p>5.4 Describe the Procurement Procedure included in Section 3 of AS3551.</p> <p>5.5 Describe the Acceptance Procedure included in Section 4 of AS3551.</p> <p>5.6 Describe the safety tests listed in Section 5 of AS3551.</p> <p>5.7 Describe suitable test devices to perform the tests listed in Section 5 of AS3551.</p> <p>5.8 List the essential Safety and Performance Parameters of common medical equipment.</p>
Learning Outcome 6	Describe methods of managing medical equipment, service contracts and the evaluation of new medical equipment

	products.
Assessment criteria	<p>6.1 Describe the use of databases in the ongoing management of medical equipment.</p> <p>6.2 Describe cataloguing methods appropriate to an equipment management program.</p> <p>6.3 List the factors to be considered when assessing a service contract for an item of medical equipment.</p> <p>6.4 Describe the process and factors involved in assessing the appropriateness of inhouse technical support or service contract for an item of medical equipment.</p> <p>6.4 Describe a typical product evaluation process for an item of medical equipment.</p>
Learning Outcome 7	Describe the appropriate management reports required for clinical engineering workshop.
Assessment criteria	<p>7.1 Explain the risks reporting requirements and procedures in AS2500.</p> <p>7.2 Describe the accreditation guideline and process as related to technical management.</p> <p>7.3 Prepare a report to management on technical issues relating to the design of buildings incorporating electromedical treatment areas.</p>
Learning Outcome 8	Describe the process for subjecting an item of medical equipment to a clinical trial.
Assessment criteria	<p>8.1 List the factors to be considered when implementing a clinical trial of medical equipment.</p> <p>8.2 Describe the pre-trial requirements of a clinical trial.</p> <p>8.3 Describe the support required for a clinical trial.</p> <p>8.4 Describe the evaluation and documentation phase of a clinical trial.</p>
Learning Outcome 9	Establish a contingency plan for a small health care facility.
Assessment criteria	<p>9.1 List the major reticulated utilities on which appropriate patient care is dependent.</p> <p>9.2 Describe suitable alternative resources to the major utilities.</p> <p>9.3 Describe appropriate document protocols for contingencies.</p> <p>9.4 Describe appropriate equipment protocols for contingencies.</p> <p>9.5 Design and document a contingency plan for a small health care facility.</p>
8 Delivery of the module	

Delivery strategy

Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective way to achieve this is by the integration of theory and practice where students learn by experimentation and through research and laboratory reports. It is recommended that learning and assessment be facilitated in a holistic manner, which may require a learning outcome sequence other than that indicated in the module.

Resource requirements

Resources should be sufficient for students to carry out practical exercises in small groups.

Useful references include:

Carr, Joseph J., Brown John M. Introduction to Biomedical Equipment Technology, Third Edition, Prentice Hall, 1998. ISBN 0-13-849431-2

Carr, Joseph J. Biomedical Equipment - Use, Maintenance and Management, Prentice Hall, 1992. ISBN 0-13-257577-9

Occupational health and safety requirements

A safe and healthy environment will be provided for students and teachers as well as safety procedures followed with regard to teaching/learning activities.