1 Module Details

Module Name	Microbiology of Infection Control
Nominal duration	It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 18 to 20 hours.
Module code	NUE912
Discipline code	0703230

2 Module purpose

This module provides students with the knowledge and skills to implement effective infection control procedures in a clinical engineering environment.

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. Introduction to general terminology eg
   - pathogen
   - transmission
   - infection
   - opportunistic
   - reservoirs
2. Causal agents of infection and general detection methods
   - fungi
   - protozoa
   - bacteria
     - nomenclature
   - viruses
   - prions
3. Conditions favouring survival and growth of pathogens *in vitro* eg
   - nutrient needs and availability
   - temperature and humidity
   - pH
   - aerobic or anaerobic conditions
4. Transmission of pathogens and transmission of diseases
   - modes of transmission
   - portals of entry and exit
   - nosocomial infections
5. Control of micro-organisms eg:
   - septic and aseptic techniques
   - disinfection
   - decontamination
   - sanitisation
   - pasteurisation
   - sterilisation
   - barrier techniques

- cleaning procedures
- pyrogens
- use of radiation
- waste disposal guidelines

6. Types of infectious diseases in the health care setting eg:
   - influenza and colds
   - hepatitis A, B and C
   - HIV
   - Tuberculosis
   - tetanus
7. Risk assessment and management
   - identification of the microbiological risks
   - evaluation of the microbiological risks
   - special risk cases
   - control of microbiological risk
     - routine monitoring such as blood tests and X-rays
     - immunisation

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

Outline the ways in which pathogenic organisms are transmitted.

Assessment criteria

1.1 Explain the meaning of key terms such as:
- infection
- microorganisms
- fungi, protoza, bacteria, viruses, prions
- pathogen, non-pathogen
- transmission
- viability, bacteriostatic
- aerobic, anaerobic
- spores
- opportunistic
- reservoirs

1.2 Compare the general morphology of the classes of microorganisms: fungi, protozoa, bacteria, viruses, prions.

1.3 List conditions that favour viability of microorganisms.

1.4 Compare the modes of transmission of microorganisms into the human body.

1.5 Identify portals of entry and exit of organisms.

1.6 Explain the meaning of the term nosocomial infection

Learning Outcome 2	Identify and apply the methods of infection control used in the health care setting.
Assessment criteria	2.1 Describe the range of infection control methods used in health care facilities. 2.2 Apply the principles and methods of infection control to establish routine standard precautions for the service, maintenance and repair of medical equipment. 2.2 List the procedures for cleaning medical equipment and the precautions that should be taken. 2.3 Apply correct waste control methods.
Learning Outcome 3	Apply appropriate assessment and risk management techniques when handling equipment that may be a source of infection.
Assessment criteria	3.1 Identify microbiological risk. 3.2 Evaluate levels of risk. 3.3 Identify special cases of risk. 3.4 Compare levels of effectiveness of risk control. 3.5 Choose the most effective risk control procedure to be adopted when servicing an item of equipment and then recommissioning it for service.
Learning Outcome 4	Contribute to the development and application of risk management procedures.
Assessment criteria	4.1 Identify existing OH&S personnel such as the Infection Control nurse and the OH&S officer, and list the guidelines or procedures (established by these people) that are pertinent to the clinical engineering service technician. 4.2 Identify the types of infectious diseases prevalent in the health care setting. 4.3 Identify monitoring and protection programs (such as chest X-rays, blood tests and immunisation), that may aid in the minimisation of risk to the technician.
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 on an individual basis. A laboratory equipped for media pouring, autoclaving of used plates. One technician to prepare the plates and manage the incubation of the plates.

	Recommended references include:
	National Health and Medical Research Council, Infection Control in the Health Care Setting, 1st Ed., A.G.P.S, Canberra, 1996.
	Lee, G. & Bishop, P. Microbiology and Infection Control for Health Professionals, Prentice Hall, 1997.
	AS 1487 – 1994 Code of Practice for cleaning, disinfecting and sterilising reusable medical and surgical instruments and equipment, and maintenance of associated environments in health care facilities
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. This is a very low risk practical. It is performed in a laboratory dedicated to the handling of microbiological organisms, so personal safety clothing will be required. Close supervision will be required for this practical.