Module Specification

Life Science for Clinical Engineering

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Contents

Part 1: Information

Module title: Life Science for Clinical Engineering

Module code: USSJS3-45-1

Level: Level 4

For implementation from: 2024-25

UWE credit rating: 45

ECTS credit rating: 22.5

College: College of Health, Science & Society

School: CHSS School of Applied Sciences

Partner institutions: None

Field:

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: Yes

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module of learning is an introduction to life science applicable to clinical engineering practice.

Features: Not applicable

Educational aims: The overall aim of this module is to introduce apprentices to Clinical Engineering. The apprentices will be introduced to the foundation knowledge of the applicable physiology and medical equipment in a modern

healthcare environment. It will develop the necessary knowledge, skills and processes in order to ensure that the apprentices are able to report on and confirm the safety of Medical Equipment commonly encountered in Clinical Engineering.

As an introductory module it will give the apprentice:
-An overview of the Anatomy, Physiology, Microbiology and the associated medical equipment that are regularly encountered in clinical engineering.
-Reinforce the importance of the application of clinical engineering principles and methods to maintain the safety of medical equipment.
-Ensure that the apprentices have the requisite hand skills and practical aptitude for routine clinical engineering tests and quality assurance.

Outline syllabus: This module is designed to provide the apprentices with the focused engineering skills and scientific knowledge that will underpin their Clinical Engineering practice and provide the foundation for study as a Healthcare Science Clinical Technologist Practitioner.

Clinical Engineering Practice
-Introduction to the role of Clinical Engineering in modern healthcare.
-Introduction to the health, safety & security risks unique to the Clinical Engineering Environment

Clinical Engineering Anatomy, Physiology and Pathogens
-Introduction to the Human Cellular, Tissue and Anatomical Structures commonly encountered in Clinical Engineering
-Introduction to the Human Physiological Systems and Pathologies commonly encountered in Clinical Engineering
-Introduction to Pathogenic Microorganisms and Infection control measures commonly encountered in Clinical Engineering.

Medical Equipment in Clinical Engineering
-Introduction to the requirement for Medical Equipment for Physiological Measurement and therapeutic interventions common in Clinical Engineering.
-Introduction to some common Medical Equipment for Physiological Measurement

and therapeutic interventions in clinical engineering

Clinical Engineering Scrutiny & Reporting
-Introduction to possible adverse effects of medical equipment and systems on human physiology common in Clinical Engineering
-Introduction to routine measurements, inspections and quality assurance on a range of Medical Devices.

Part 3: Teaching and learning methods

Teaching and learning methods: This module will be delivered via a blended approach of on-campus practical and skills development activities held during block release weeks, and online lectures, seminars and tutorials, held throughout the academic term.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Apply basic cellular, tissue and anatomical terminology in order to describe and explain the structure, function and common pathologies of key human physiological systems in the context of Clinical Engineering activities.

MO2 Explain the importance of diverse pathogenic microorganisms, e.g. bacteria, viruses, fungi and parasites, in the context of disease and infection control in order to support Clinical Engineering activities.

MO3 Use engineering principles (including numerical methods) to identify and explain the potential adverse effects of medical equipment on human physiology in order to support Clinical Engineering activities.

MO4 Perform, and explain the rational for, a range of simple biomedical measurements and quality assurance tests within a professional context in order to support Clinical Engineering activities.

MO5 Apply practical skills in data observation, collection, handling and report writing in order to support Clinical Engineering activities.

MO6 Identify and explain the rationale for monitoring and maintaining health, safety and security in order to support specific Clinical Engineering activities.

Hours to be allocated: 450

Contact hours:

Independent study/self-guided study = 150 hours

Placement = 0 hours

Face-to-face learning = 60 hours

Total = 210

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link

Part 4: Assessment

Assessment strategy: The assessments within this module will allow the apprentices to demonstrate their knowledge and the development of their skills applicable within their Clinical Engineering discipline.

Assessment 1:
A written assessment (90 minutes). This task will assess the apprentices knowledge of life science principles and measurements as well as knowledge relating to anatomical systems, pathologies and equipment relevant to clinical engineering disciplines.

The apprentices will receive formative feed-forward by completing similar style questions through the course and tutorial sessions that will be focused on worked solutions that will direct them to be familiar with the extensive support materials supplied in the virtual learning environment.

Assessment 2:
In line with the National School of Healthcare Science (NSHCS) requirements, this

will be a portfolio of content showing knowledge and practical skills directly applicable to their Work Based Learning it will also be used to demonstrate their fitness to practice. This will be assessment as learning for the content in the module. The evidence presented will be led by the needs of each individual workplace but will comprise the following:

Professional competencies (As per the NSHCS requirements).

Direct Observation of Practical Skill (DOPS).

A Case Based Discussion (CbD). This will be specified and assessed by the apprentices's workplace assessor.

The module content will complement the professional competencies. Formative feed-forward will be given at the start of the module through group discussion, and on-campus workshops and Laboratory exercises. Formative feedback will be given periodically by the Apprentice's Work Place Assessors throughout the module.

Assessment tasks:

Portfolio (First Sit)
Description: Portfolio of Work Based Learning Competencies, Direct Observation of Practical Skill (DOPS) and a Case Based Discussion (CbD).
Weighting:
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6

Set Exercise (First Sit)
Description: A written In-class test made up of short and long answers (90 mins)
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO6

Portfolio (Resit)
Description: Portfolio of Work Based Learning Competencies, Direct Observation of Practical Skill (DOPS) and a Case Based Discussion (CbD).
Weighting:
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6

Set Exercise (Resit)
Description: A written In-class test made up of short and long answers (90 mins)
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO6

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Healthcare Science (Medical Engineering) {Apprenticeship-UWE} [Frenchay] BSc (Hons) 2024-25

Healthcare Science (Radiation Engineering) {Apprenticeship-UWE} [Frenchay] BSc (Hons) 2024-25

Healthcare Science (Rehabilitation Engineering) {Apprenticeship-UWE} [Frenchay] BSc (Hons) 2024-25

Healthcare Science (Renal Technology) {Apprenticeship-UWE} [Frenchay] BSc (Hons) 2024-25