Module Specification

Smart Sensing

Version: 2023-24, v2.0, 19 Jun 2023

Contents

Part 1: Information

Module title: Smart Sensing

Module code: USSJLH-15-M

Level: Level 7

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Health & Applied Sciences

Department: HAS Dept of Applied Sciences

Partner institutions: None

Delivery locations: Not in use for Modules

Field: Applied Sciences

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 will build on the compulsory module, "Innovation for healthcare", which will allow advanced understanding of these devices. A key topic series in this module will be the introduction of innovative technologies such as implantable and wearable sensors.   The module will be delivered through a series of lecture, tutorial and practical classes. By the end of the module the students will be able to design (bio)sensor systems for given healthcare applications. The students

will also be introduced to innovative technology, potentially providing the platform for their independent development of a new biosensor.

Features: Not applicable

Educational aims: The aim of this module is to provide a detailed overview of current sensors and biosensors important to the Healthcare sector.

Outline syllabus: •Introduction to Biosensors and biomarkers.

•Biomolecular recognition themes.

•Sample collection and preparation.

•Conventional and nanotechnology-based transduction schemes.

•Physical and physiological sensors.

•Data analysis and performance factors.

Part 3: Teaching and learning methods

Teaching and learning methods: Lectures: This module will be delivered in integrated lectures, that detail innovative technologies such as implantable and wearable sensors.

Tutorials: Tutorial classes will support each relevant lecture or practical class.

Practical classes: Several classes will be included that are linked to the lecture series offering the students an applied understanding of each topic section.

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

> **MO1** Synthesise state of the art sensors and biosensors important to the Healthcare sector (Component A and B).

> **MO2** Critically evaluate the key elements of a biosensor system from sample collection to output to the user (Component A).

> **MO3** Critically evaluate how innovative technologies such as implantable and wearable sensors can make an impact on future healthcare (Component A).

MO4 Critically review the different types of sensor technologies and their applications, and to apply this knowledge to the practical design and characterisation of a (bio)sensor for a given diagnostic application (Component A and B).

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://rl.talis.com/3/uwe/lists/77C368F1-FA69-93ED-0709-0EA864807CC0.html

Part 4: Assessment

Assessment strategy: Assessment 1:

Assessment 1 is a laboratory report. This assessment is designed to develop understanding of how to report on a practical experimental exercise (1500 words). The write up of the lab practical class will test their attention to detail, ability to write clearly and concisely and also evidence competence in laboratory skills.

Assessment 2:

Assessment 2 is an online examination, designed to take 2 hours, which will test knowledge and critical understanding of core concepts delivered during lectures and tutorial classes.

Formative assessment support will be provided for the students prior to the examination, where students can send sample exam answers for formative feedback. Other formative feedback opportunities are available through the tutorial sessions.

Assessment components:

Laboratory Report (First Sit)

Description: Practical Report (1500 Words).

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO4

Examination (Online) (First Sit)

Description: Examination

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Laboratory Report (Resit)

Description: Practical Report (1500 Words).

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO4

Examination (Online) (Resit)

Description: Examination

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Health Technology [Frenchay] MSc 2023-24

Health Technology [Frenchay] MSc 2022-23