

Electronics for Bio-Sensing

Module Code:	MHT5012-B
Academic Year:	2018-19
Credit Rating:	20
School:	Department of Biomedical and Electronics Engineering
Subject Area:	Medical and Healthcare Technology
FHEQ Level:	FHEQ Level 5
Module Leader:	Dr James Noras

Additional Tutors:

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	24
Laboratory	48
Directed Study	128

Availability Periods

Occurrence	Location/Period
BDA	University of Bradford / Academic Year (Sept - May)

Module Aims

To equip students with the skills and understanding relevant to the use of modern electronic systems for biomedical signal detection, storage and analysis.

Outline Syllabus

- 1) Introduction to Arduino hardware and software development.
- 2) Analogue systems for signal acquisition and processing - operational amplifier applications.
- 3) Characteristics of sensor systems: sensor types and physical design.

- 3) Requirements and techniques for signal sampling, analogue to digital conversion and analysis.
- 4) Computer methods for signal capture and display: Arduino (or equivalent) and MATLAB interfacing.
- 5) Essential characteristics of digital systems, computer structure and hardware; elements of logic design for interface development, software for processing and information display.
- 6) Practical experience with analogue and digital circuit construction, sensor interfacing, conditioning and calibration methods and instrumentation for testing.

Module Learning Outcomes

On successful completion of this module, students will be able to...

- 1 Demonstrate broad knowledge of modern techniques and analytical methods for the acquisition, processing and characterisation of biomedical signals
- 2 Demonstrate the ability to design, build, interface and test sensors for the acquisition, storage, display and analysis of biomedical data.
- 3 Demonstrate the ability to present the outcomes of design, experimentation and analysis through the use of a laboratory logbook

Learning, Teaching and Assessment Strategy

Essential backbone of interactive lectures with tutorials to evaluate theory and practice.

Largely lab-based work, both hands-on and computer-based design, simulation and analysis.

Coursework portfolio of lab work, results and analysis, with one class test mid-way through the year.

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Summative	Examination - practical/lab oratory	Portfolio of practical work assessed in laboratory sessions		40%	No
Summative	Coursework	Portfolio of reports: summaries and analyses of mini-projects.		50%	Yes
Summative	Classroom test	Classroom test	2 hours	10%	No

Legacy Code (if applicable)

Reading List

To view Reading List, please go to [rebus:list](#).