**MODULE DESCRIPTOR**

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| TITLE | Robotics |
| MODULE CODE | 55-608216 |
| LEVEL | 6 |
| CREDITS | 20 |
| COLLEGE | BTE |
| DEPARTMENT | Computing |
| SUBJECT GROUP | COMPUTER SCIENCE AND SOFTWARE ENGINEERING |
| COLLABORATIVE PARTNER / LOCATION (If applicable) |  |
| TOTAL NUMBER OF NOTIONAL STUDY HOURS FOR THIS MODULE Based on 10 notional study hours per credit | 200 |
| TOTAL NUMBER OF SCHEDULED LEARNING AND TEACHING ACTIVITIES | 48 |
| TOTAL NUMBER OF INDEPENDENT LEARNING HOURS Including time allowed for assessment activities | 152 |
| TYPICAL NUMBER OF SCHEDULE LEARNING AND TEACHING ACTIVITIES PER WEEK |  |

**MODULE LEARNING OUTCOMES**

* Identify and critically assess the elements needed within a physical computing system
* Interface a programmable controller with peripheral devices such as sensors, switches, key pads, motors, lights, sound, displays and other input devices and actuators.
* Determine what types of devices are appropriate for various products and processes.
* Design and implement 'control' algorithms for the relevant hardware platforms.

**MODULE AIM**

In recent years, ‘electronics’ has moved away from the design and development of circuitry and towards the use of programmable devices which receive input from (many) sensors and use that information in various ways to ‘control’ outputs and produce effects. This movement is reflected in an emerging terminology which refers to the "internet of things" and "physical computing", classic examples being the use of arduino boards, robotics, raspberry pi’s and similar single board computers. Applications are widespread: in so-called 'physical computing', robotics, graphics, textiles, real-time 'big data' monitoring applications and the home.  
The aim of this skills-based module is to expose 'computing students' to this emerging aspect of IT technology and explore software application development for such platforms.

**INDICATIVE CONTENT**

* Prototyping tools, processes, and methods
* The elements of a physical computing system: controller, motors, sensors etc
* Embedded devices and operating systems.
* Robotics and other applications
* Vision
* Handling real-time data
* Control algorithms.

**LEARNING, TEACHING AND ASSESSMENT - STRATEGY AND METHODS**

Students will be supported in their learning, to achieve the above outcomes, in the following ways:

Topics will be presented in lectures and workshops incorporating a practical programme. Students will be supported by tutors; peer discussion and review will be encouraged in the development of a creative proposal for each assessment task. Student's skills in receiving and giving constructive feedback will be honed and they will develop their ability to reflect upon lessons learned.

**ASSESSMENT INFORMATION**

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| Task No. | Assessment Task Description (e.g. essay, artwork, journal etc) | Word Count or Exam Duration | Task Weighting % | Assessment Task Type Coursework (CW) Written Exam (EX) Practical (PR) |
| 001 | Essay/Video | 2000 | 40 | CW |
| 002 | Essay/Video/Presentation | 2500 | 60 | CW |

**LEARNING RESOURCES FOR THIS MODULE**

Are included in the Learning Materials section of the module site.