## Embedded Systems

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| *SMS Code* | IN620001 | *Directed Learning hours* | 60 |
| *Level* | 6 | *Workplace or Practical Learning hours* | 0 |
| *Credits* | 15 | *Self-Directed Learning hours* | 90 |
| Prerequisites | IN520001 | *Total Learning Hours* | 150 |
| *This course approved in another Programme: No* | | | |

***Aims***

To introduce students to the core principles of computer hardware and architecture and to acquaint them with a range of embedded application contexts. (This paper is ***not*** intended to provide the skills required to design a better CPU, nor is it intended to teach students to write in assembler.)

***Learning Outcomes***

At the successful completion of this course, students will be able to:

1. Make decisions about appropriate architectures, components, performance metrics, and program design when faced with a specific application development task
2. Analyse the problem parameters of an embedded computing situation
3. Select the appropriate hardware for an embedded computing situation
4. Implement a simple representative embedded system.

***Indicative Content***

* Low-level hardware (registers, buses, and clocks, memory, storage, I/O, addressing, etc.)
* Low-level instruction processing
* CPU design principles
* High-level architecture (e.g. caching, VM, dedicated hardware, multicore processing, etc.)
* Embedded application areas with microprocessors and microcontrollers
* Theory and principles of embedded/control systems
* Embedded system hardware
* Embedded system software
* Embedded system project work

***Assessment***

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| **Assessment Activity** | **Weighting** | **Learning Outcomes** |
| Theory quizzes | 30% | 1,2,3 |
| Project work | 70% | 1,2,3,4 |

***Resources***

**Required:**

This paper will require appropriate hardware, materials and SDKs for construction of modern embedded systems.

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