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| **TSC Category** | Design and Architecture | | | | | |
| **TSC Title** | Embedded Systems Integration | | | | | |
| **TSC Description** | Implement control systems to perform pre-defined tasks and also real-time monitoring for the real world | | | | | |
| **TSC Proficiency Description** | **Level 1** | **Level 2** | **Level 3** | **Level 4** | **Level 5** | **Level 6** |
|  |  | **ICT-SYS-3001-1.1-1** | **ICT-SYS-4001-1.1** | **ICT-SYS-5001-1.1** |  |
|  |  | Model, operate and integrate a variety of sensors and actuators for real world applications | Design and develop embedded system processes for the interfacing of embedded systems to the real world | Lead the evaluation of the performance of embedded systems against specified requirements and user expectations |  |
| **Knowledge** |  |  | * Underlying concepts pertaining to performance specification and analysis * Implementation of component interconnections and signal conditioning concepts * Applications of analogue sensors and transducers * Applications of the digital transducers * Actuator networks | * Definition of embedded systems * Requirements, specifications and challenges involved in designing embedded systems * Product design, development cycle and management * Building blocks of an embedded system * Real-world interfacing * Considerations and constraints of systems development process | * Embedded systems requirements * Embedded systems user expectations and/or needs * Software metrics to be evaluated |  |
| **Abilities** |  |  | * Execute performance specification and analysis of sensors and actuators for real life applications * Utilise commonly adopted component interconnections and signal conditioning principles in automation * Apply analogue sensors and transducers to solve real world control problems * Apply digital transducers to solve real world control problems * Develop actuator networks with stepper and continuous drive actuators | * Design and develop processes of embedded systems * Interface and implement embedded systems to the real world * Implement exception and interrupt handling * Implement user acceptance testing (UAT) environments for product testing | * Analyse the main characteristic roles of a processor in the embedded systems design * Appraise the qualifying factors of processors performance and key features of high level language (HLL) in embedded system development * Examine the architecture and operating principles of data structures in embedded systems programming * Evaluate real-time operating system (RTOS) functions and task scheduling models in embedded systems against user expectations and/or needs * Propose improvements to the embedded systems |  |
| **Range of Application** |  | | | | | |