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South East Technological University

Module Descriptor

Industrial Automation Systems (Computing and Mathematics)

Industrial Automation Systems (A14182)

Short Title: Industrial Automation Systems
Department: Computing and Mathematics
Credits: 5 **Level:** Intermediate

Description of Module / Aims

Industrial Automation Systems are pervasive in the Manufacturing and Service Industries. Systems vary from small turn-key systems to large integrated systems complete with Supervisory Control and Data acquisition/-analysis. In this module, students will use industry-standard industrial controllers, networking and User-Interface technologies required to develop Automated Systems. Safety considerations will also be covered.

Programmes

		stage/semester/status
COMP-0665	BSc (Hons) in Applied Computing (WD_KACCM_B)	2 / 4 / E
COMP-0665	BSc (Hons) in Applied Computing (WD_KCOMP_B)	2 / 4 / E
COMP-0665	BSc (Hons) in Computer Science (WD_KCMSC_B)	2 / 4 / E

Indicative Content

- Industrial Automation Systems: Overview; architectures; standards; development methodologies
- Process specification and automation design
- Programming, Commissioning and Testing of solutions to Automated Control problems
- Integrating hardware and software based safety systems
- Automation of systems using Analog Sensors and Transducers; Typically, involving closed-loop control
- Human-Machine Interfacing, Supervisory Control and Data Acquisition and Networking

Learning Outcomes

On successful completion of this module, a student will be able to:

1. Appraise the characteristics, options and application of Industrial Automation Systems in batch and continuous process systems.
2. Analyse the hardware/interface requirements when controlling different categories of industrial process.
3. Develop embedded control software on Industry standard Industrial Control Systems.
4. Design, commission and test event-driven solutions to common Industrial Automation Processes.
5. Analyse the safety requirements of different Industrial Automation scenarios.
6. Use industry standard Human-Machine Interface and networking technologies.

Learning and Teaching Methods

- Combination of lectures and lab-based practicals.
- The lectures will cover the theory and underlying technologies behind Industrial Automation Systems.
- The lab-based practicals, building on the theoretical knowledge from lectures, provide the practical skills to design, model, simulate and implement Industrial Automation Systems.
- The practical content will use industry standard technologies and tools to design, model and implement Industrial Automation Systems.
- Student will be encouraged to enhance their lab work and assessment submissions using self-directed research and learning into Industrial Automation Systems.

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	24	
Practical	24	
Independent Learning	87	

Assessment Methods

	Weighting	Outcomes Assessed
Continuous Assessment	100%	
Lab Report	30%	2,3,4,5,6
In-Class Assessment	20%	1,4,5
Assignment	50%	2,3,4,6

Assessment Criteria

<40%: Inability to demonstrate simple software and hardware designs from user requirements.

40%–49%: Able to specify interfacing and software requirements for simple discrete control systems.

50%–59%: In addition, be able to implement industrial controller based solutions for simple discrete control systems.

60%–69%: In addition, be able to develop optimised designs for a specific industrial control system.

70%–100%: In addition, combine self-directed research of Industrial Automation Systems in assessment work. Exhibit the ability to solve unforeseen problems through the use and modification of self-learned skills and tools.

Requested Resources

- Computer Lab: BYOD Lab