DPEIC2611: Instrumentation and Control Engineering

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<tr><td colspan="2">MODULE DETAILS</td><td colspan="2">Instrumentation and Control Engineering DPEIC2611

Nominal duration in hours: 36

This time commitment includes the structured activities, preparation reading, and attendance at each webinar, completing exercises, practical assessments, and proctored assessments.
It is also expected that students spend additional time on readings, personal study, independent research, and learning, practicing on remote labs and required software and working on any projects and assignments.
This module covers control theory, process control instrumentation, process measurement, control elements, and optimisation and reliability.</td></tr>
<tr><td colspan="2">MODULE PURPOSE</td><td colspan="2">The purpose of this module is for participants to develop broad knowledge of role of instrumentation for control in industrial facilities, and principles and strategies that can be used to monitor and optimise plant operations.</td></tr>
<tr><td colspan="2">MODIFICATION HISTORY</td><td colspan="2">Rev 4.0</td></tr>
<tr><td colspan="2">PREREQUISITE AND/OR CO-REQUISITE MODULES</td><td colspan="2">N/A</td></tr>
<tr><td colspan="2">SUMMARY OF LEARNING OUTCOMES</td><td colspan="2">1. Outline process control theory and applicable equipment types
2. Outline key strategies and systems for control engineering
3. Outline instrumentation principles applicable to monitoring and optimising process plants operations</td></tr>
<tr><td colspan="2">LEARNING OUTCOMES</td><td colspan="2">ASSESSMENT CRITERIA</td></tr>
<tr><td colspan="2">Learning outcomes specify what students will be able to do as a result of the learning.</td><td colspan="2">Assessment criteria provide the criteria by which achievement of the learning outcomes will be judged.</td></tr>
<tr><td rowspan="4">1</td><td rowspan="4">Outline process control theory and applicable equipment types</td><td>1.1</td><td>Explain the role of instrumentation and control engineering in optimising process plant operations</td></tr>
<tr><td>1.2</td><td>Explain basic control system theory</td></tr>
<tr><td>1.3</td><td>Explain key components and equipment in instrumentation systems</td></tr>
<tr><td>1.4</td><td>Outline the principles of control systems for industrial process plants</td></tr>
<tr><td rowspan="3">2.</td><td rowspan="3">Outline key strategies and systems for control engineering</td><td>2.1</td><td>Explain fundamental process control strategies used in process plants</td></tr>
<tr><td>2.2</td><td>Outline the role of proportional-integral-derivative (PID) controllers in regulating process variables</td></tr>
<tr><td>2.3</td><td>Outline advanced control strategies used for complex processes</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Outline instrumentation principles applicable to monitoring and optimising process plants operations</td><td>3.1</td><td>Explain the instrumentation used to measure key process variables</td></tr>
<tr><td>3.2</td><td>Outline the role and integration of real-time data acquisition systems for monitoring process control</td></tr>
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		3.3	Explain how instrumentation and control systems contribute to process optimisation, predictive maintenance, and energy efficiency in process plants.
		3.4	Outline applications for digitisation and the Industrial Internet of Things for instrumentation and control systems
DELIVERY MODE		Online and/or face-to-face	
SPECIALISED RESOURCES		N/A	
ASSESSMENT STRATEGY		**METHODS OF ASSESSMENT** Assessors must gather a range of evidence that is valid, sufficient, current, and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, structured assessments, samples, and questioning. This will include short answer questions on the knowledge content, the use of remote and virtual labs, and writing tasks to apply the learning to academic tasks. **CONDITIONS OF ASSESSMENT** **Assessor Requirements:** Assessors must satisfy the assessor requirements in the standards for registered training organisations (RTOs) current at the time of assessment. Assessors must also hold a tertiary qualification in engineering or related field. The RTO must also ensure that assessors are able to demonstrate how they keep their industry knowledge up to date through ongoing professional development. The RTO must take appropriate steps, as an ongoing procedure, to verify information about each assessor's qualifications, vocational competencies, and current industry skills. **Assessment Conditions:** Questioning techniques should not require language, literacy, and numeracy skills beyond those required in this module. The candidate must	

	have access to all tools, equipment, materials, and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals, and reference materials. Assessments may be open book assessment and may be completed off campus. Invigilation software will be used for some assessments to ensure authenticity of work completed. Model answers and marking guide must be provided for all knowledge-based assessments to ensure reliability of assessment judgements when marking is undertaken by different assessors.