

Mechanical Engineering and Mechatronics Engineering

DMX5403 Control Systems Engineering

Level	5
Course Code	DMX5403
Course Title	Control Systems Engineering
Credit Value	4
Core/ Optional	Core
Course Aim/s	The aim of this course is to gain an understanding of the principles of classical and digital control systems, analysis and design
Course Learning Outcomes (CLO)	<p>At the completion of this course student will be able to:</p> <p>CLO1: Demonstrate knowledge of control system in engineering applications. CLO2: Model a control system using mathematical and graphical techniques. CLO3: Analyze time domain characteristics of a control system. CLO4: Analyze the stability of a control system using classical methods. CLO5: Design simple control systems using classical methods. CLO7: Analyze and design discrete time systems for controls. CLO8: Analyze a control system using computer software.</p>
Content (Main topics ,sub topics)	<p>Outline Syllabus:</p> <p>Unit 1: Modelling of control systems Unit 2 : Time domain analysis Unit 3: Stability of control systems Unit 4 : Design of control systems Unit 5: Digital control systems</p> <p>Laboratory work:</p> <ol style="list-style-type: none"> 1. Stability control of a single-input-single-output system using the magnetic levitation apparatus 2. Stability control of a single-input-multi-output system using the inverted pendulum apparatus 3. Stability control of a multi-input-multi-output system using the twin rotor apparatus 4. Simulation project with MATLAB <p>Mini-project:</p> <p>Mini-project and a viva based on control system design</p>