DMX6305 Modern Control Systems

Level	Level 6
Course Code	DMX6305
Course Title	Modern Control Systems
Credit value	3
Core/Optional	Core
Course Aim/s	Aim of this course is to provide the State-space analysis methods and multivariable controller design, as well as an introduction to nonlinear control.
Course Learning Outcomes (CLO):	At the completion of this course student will be able to CLO1: Model sampled-data systems using difference equations, block diagrams and transfer functions. CLO2: Analyze discrete systems using transform techniques. CLO3: Analyze the stability of a control system using discrete methods. CLO4: Examine the stability of feedback systems. CLO5: Design digital controllers to suit the industrial applications. CLO6: Design digital control the systems with nonlinear behaviors. CLO7: Use MATLAB and SIMULINK in the analysis and simulation of discrete control systems.
Content	**Outline Syllabus:** Unit 1: Introduction to digital control system Unit 2: Modeling discrete-time systems by pulse transfer function Unit 3: Stability analysis of discrete time systems Unit 4: Time response of discrete systems Unit 5: Design of sampled data control systems Unit 6: Deadbeat response design Unit 7: Discrete state space model Unit 8: Controllability, observability and stability of discrete state space models Unit 9: Introduction to optimal control **Laboratory Work:** 1. Demonstrates state-space representations and the construction of corresponding discrete equivalents using simulation. 2. Evaluate performance criteria through simulations and the review of nonlinear control design.