


QUBE-SERVO 2

QUBE-SERVO 2 CURRICULUM

LAB EXPERIMENTS OVERVIEW

	Topic	Original Labs	New Labs
DC MOTOR LABS	Instrumentation	<ul style="list-style-type: none"> • Hardware integration • Filtering 	
	Modelling	<ul style="list-style-type: none"> • Step response modelling • Block diagram modelling 	<ul style="list-style-type: none"> • Parameter estimation • Frequency response modelling • State-space modelling • Friction identification
	Control Analysis	<ul style="list-style-type: none"> • Stability analysis • Second-order systems 	<ul style="list-style-type: none"> • Routh-Hurwitz stability • Nyquist stability
	Control Design	<ul style="list-style-type: none"> • PD control • Lead compensator 	<ul style="list-style-type: none"> • Proportional control • Steady-State error • Load disturbance • Robustness • Optimal control
	Discrete Control		<ul style="list-style-type: none"> • Introduction to digital control • Discrete stability • Introduction to discrete control
PENDULUM LABS	Modelling	<ul style="list-style-type: none"> • Moment of inertia • Pendulum modelling • State-space modelling 	
	Control Design	<ul style="list-style-type: none"> • Pendulum balance control • Swing-up control • LQR state-feedback balance control 	<ul style="list-style-type: none"> • Pole-placement state-feedback balance control