System modelling course schedule

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Theory	Motivation, course presentation, projects Typical control Loop	Modelling of Translational and Rotational Mechanical Systems Analogies	Modelling of Level and flow systems Nonlinear example Transfer Matrix Linearization	Representation in Block diagrams, block algebra and Flow diagrams - Mason's Formula	Written Exam 1	**FIRST PROJECT DELIVERY** 1st
	1st Workshop: DORF's book Exercises	2nd Workshop: NISE's book Exercises	3rd Workshop: Non-linear model of tanks	4th Workshop: DISTEFANO III's book exercises of Block diagrams	Modelling of systems (Mechanical, flow and level plants and others)	The plant model analysis
Practice		Matlab Tutoring	Matlab Tutoring			

	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Theory	Time response analysis FO, SO and FOPDT systems, 'S' time response, complex poles, dominant poles, poles at origin, (Input -Output) Stability concept	PID tuning, use of tables, Zieglers-Nichols, Smith and Corripio, and second method of Zieglers Nichols.	PID controller synthesis, pole location with desired transfer function Zero-Pole Cancellation	Written Exam 2	**SECOND PROJECT DELIVERY** 2nd	State-Space analysis
	Project work	5th workshop Step Test IDENT	Project work	Time response analysis and tuning of PID controllers	Nonlinear and linear model simulation Instrumentation: sensors and actuators.	Project work
Practice		Matlab® Portfolio about Step -Test Training	Virtual Labs of Quanser			

	Week 13	Week 14	Week 15	Week 16
Theory	State-Space transformation to Transfer function and transformation matrix between two State-Space representations	Design of controllers State-Space Feedback with reference model	Written Exam 3	**FINAL PROJECT DELIVERY** 3rd
Practice	State-Space representations in Simulink	Project work	Controller design	Controlled system: Controller design and simulation of the closed loop system. PLUS: 3D Model