QUBE-SERVO TEXTBOOK MAPPING GUIDE



техтвоок	Control Systems Engineering 6th Edition Norman S. Nise	Feedback Systems Electronic Edition 2.11b Karl Johan Åström Richard M. Murray	Feedback Control of Dynamic Systems 6th Edition Gene F. Franklin J. David Powell Abbas Emai-Naeini	Modern Control Systems 12th Edition Richard C. Dorf Robert H. Bishop	Modern Control Engineering 5th Edition Katsuhiko Ogata	Automatic Control Systems 9th Edition Farid Golnaraghi Benjamin C. Kuo	Control Systems Engineering 5th Edition I.J. Nagrath M. Gopal	Mechatronics 3rd Edition W. Bolton
LAB EXAMPLE	John Wiley and Sons, Inc., 2011	Princeton University Press, 2012	Pearson Higher Education Inc., 2010	Pearson Higher Education, 2011	Pearson Education, 2010	John Wiley and Sons, Inc., 2010	Anshan Ltd., and New Age International Ltd., 2008	Pearson Education Ltd., 2003
Integration Lab			p. 577 Hardware Characteristics			p. 195 Incremental Encoder	p. 146-148 Optical Encoders	p. 29-30 Encoders p. 110-112 DAQs and LabVIEW p. 254-261 MATLAB/Simulink
Filtering Lab		p. 308 Filtering the Derivative	p. 371 Design Considerations	p. 246-247 Measurement Noise Attenuation	p. 161-162 Unit-Step Response of First-Order Systems	p. 246-247 Measurement Noise Attenuation	p. 411 Frequency Response of Closed-Loop Systems p. 497 Summary of Effects of PD Control	p. 66-67 Filtering
Bump Test Lab	p. 166-168 First-Order Transfer Functions via Testing	p. 47-48 Modeling from Experiments			p. 95-97 (A-3-9) Mathematical Modeling of Mechanical Systems and Electrical Systems	p. 63-64 First-Order Prototype System	p. 197-198 Time Response of First-Order Systems	p. 224-230 First-Order Systems
First Principles Modeling Lab	p. 79-84 Electromechanical System Transfer Functions	p. 28-31 Modeling Concepts	p. 47-49 Modeling a DC Motor	p. 70-74 Transfer Function of the DC motor		p. 198-205 DC Motors in Control Systems	p. 135-137 DC Servomotors	p. 214-217 Electromechanical Systems — DC Motor
Second Order Systems Lab	p.173-186 The General Second- Order System	p.183-185 Second-Order Systems p.233-236 Damped Oscillator	p. 111-113 Effect of Pole Locations	p. 308-314 Performance of Second-Order Systems	p. 164-179 Second-Order Systems	p. 275-289 Transient Response of a Prototype Second- Order System	p. 199-210 Time Response of Second-Order Systems	p. 267-268 Second-Order Systems p. 230-239 Frequency Response for a Second-Order System
PD Control Lab	p. 470-477 Ideal Derivative Compensation p. 500-503 Minor-Loop Feedback Compensation	p. 293-298 PID Control	p. 186-191 The Three-Term Controller: PID Control p. 184-185 System Type for a DC Motor Position Control	p. 480-488 PID Controllers	p. 567-569 PID Control p. 590-591 PID Control	p. 289-293 Speed and Position Control of a DC Motor p. 492 Design with the PID Controller p. 314-316 Basic Control Systems Utilizing Addition of Poles and Zeros	p. 216-219 Derivative Error Compensation p. 477-483 Tuning of PID Controllers	p. 288-290 Derivative Control p. 297-299 Control System Performance p. 301-302 Velocity Control
Stability Analysis Lab	p. 303-305 Stability	p. 102-107 Stability	p. 108 Effect of Pole Locations p. 130-133 Stability	p. 387-390 The Concept of Stability	p. 182 Stability Analysis in the Complex Plane	p. 73 Bounded-Input, Bounded-Output (BIBO) Stability p. 74 Relationship Between Characteristic Equation Roots and Stability	p. 270-275 The Concept of Stability	p. 278-279 Stability
Pendulum Modeling Lab	p.142 Simple Pendulum	p. 36 Cart-Pendulum System	p. 32 Pendulum P.37 Inverted Pendulum		p. 69 Inverted Pendulum System	p. 227 Inverted Pendulum on Cart	p. 42-43 Dynamics of Robot Mechanisms	
Moment of Inertia Lab	p.142 Representing a Nonlinear System	p. 35-37 Balance Systems	p. 27 Rotational Motion p. 32-33 Rotational Motion: Pendulum	p. 57-58 Pendulum Oscillator Model	p. 69-72 (3-5 and 3-6) Mathematical Modeling of Mechanical Systems and Electrical Systems	p. 157-159 Rotational Motion	p. 25 Mechanical Systems	p. 189 Mechanical Building Blocks
Balance Control Lab		p. 240-242 Balance System	p. 445 Control Law for a Pendulum	p. 186-187 Inverted Pendulum Control p. 844-846 Inverted Pendulum Control	p. 746-751 Inverted Pendulum Control		p. 584-585 (Example 12.2)	
State Space Model	p. 663-666 Design via State Space	p. 131-134 Linear Systems	p. 413-421 State-Space Design	p. 834 The Design of State Variable Feedback Systems	p. 648 Control Systems Analysis in State Space	p. 673-676 Introduction to State Variable Analysis p. 691-693 Relationship between state equations and high-order differential equations	p. 570-577 State Variable Analysis and Design p. 577-578 Linearization of the State Equation	
LQR Control Lab	p. 123-141 The General State-Space Representation p. 665-672 Controller Design	p. 167-168 State Feedback p. 170-172 Balance System p. 175-177 State Space Controller p. 190-192 Linear Quadratic Regulators	p. 425-426 Analysis of the State Equations p. 443-445 Finding the Control Law p. 457-458 and 463-466 LQR Design	p. 166-167 The State Differential Equation p. 867-869 Optimal Control Systems	p. 648-668 Control Systems Analysis In State Space p. 793-798 Quadratic Optimal Regulator Systems	p. 51 Definition of State Variables p. 730-731 Pole-Placement Design Through State Feedback	p. 574-578 State Variable Analysis and Design p. 625-630 Pole-Placement by State Feedback p. 704-707 Parameter Optimization: Regulators]	