Robotics 2
Material and Textbook Cross-references

http://www.diag.uniroma1.it/deluca/rob2_en.html

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This document describes the relationships between topics in the course program, content of PowerPoint slides of the lectures (available as PDF files in the course website), and associated parts (chapters/sections) in the course textbook in English.

The names of the files with lecture slides are in the format "NN_filename.pdf", with the number of pages in parentheses.

Former textbook (up to 2024/25):

B. Siciliano, L. Sciavicco, G. Villani, G. Oriolo: "Robotics: Modelling, Planning and Control", Springer, 2009 (3rd Edition)

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Topics/Program	**Textbook Ch.Sect.Par**	Block of slides (and their number) + Related videos (and their number) and other material
Program and information	---	00_Introduction.pdf (28), including a sneak preview of the course with videos (some repeated also later in the course material) + 00_Rob2_Videos.zip (19)
Advanced kinematics		
Kinematic calibration	**2.11**	01_Calibration.pdf (16) + 01_Rob2_Videos.zip (3)
Redundant robots	**2.10.2** **3.4** **3.5** **App. A.7** **App. A.8**	02_KinematicRedundancy_1.pdf (55) + 02_1_Rob2_Videos.zip (12) 02_KinematicRedundancy_2.pdf (42) + 02_2_Rob2_Videos.zip (11)
Dynamic modeling of manipulators		
Euler-Lagrange dynamic model	**7.1** **7.3** **App. B**	03_LagrangianDynamics_1.pdf (31) 04_LagrangianDynamics_2.pdf (15)
Properties, extensions, and uses of dynamic models	**7.2** **7.4** **7.6** **7.7, 7.8**	05_LagrangianDynamics_3.pdf (42) + 05_Rob2_Videos.zip (3) 05b_LinearParametrizationIdentification.pdf (26) + 05b_Rob2_Videos.zip (5)
Newton-Euler dynamic model	**7.5**	06_NewtonEulerDynamics.pdf (22)
Robot control		
Introductory topics	**8.1** **App. C.2** **App. C.3**	07_IntroControl.pdf (30) + 07_Rob2_Videos.zip (9)
Position regulation in joint space (free motion)	**8.2** **8.3 (parts)** **8.5 (intro)** **8.5.1**	08_Regulation.pdf (40) + 08_Rob2_Videos.zip (1) + PIDsaturated_Kelly.pdf 09_IterativeLearning.pdf (17) + 09_Rob2_Videos.zip (3)
Trajectory tracking in joint space (free motion)	**8.5.2** **8.5.3** **8.5.4** **8.7**	10_TrajectoryControl.pdf (36) + 10_Rob2_Videos.zip (2) 11_RobustControl.pdf (24) – for personal reading 12_AdaptiveControl.pdf (22) + AdaptivePDgravity_Tomei.pdf
Cartesian control (free motion)	**8.6**	13_CartesianControl.pdf (15)

Interaction modeling and control	**All Chap. 9** **except:** **9.4.3** **9.5.2** **9.7.1**	14_EnvironmentInteraction.pdf (48) + 14_Rob2_Videos.zip (8) 15_ImpedanceControl.pdf (22) + 15_Rob2_Videos.zip (3) 16_HybridControl.pdf (35) + 16_Rob2_Videos.zip (4) ForceControl_EppingerSeering.pdf
Visual servoing (kinematic approach)	**10.1** **10.2 (parts)** **10.3.2** **10.3.3** **10.5 (parts)** **10.6** **10.7.2** **10.8.2** **10.9**	17_VisualServoing.pdf (53) + 17_Rob2_Videos.zip (23)
Seminars		
Robot actuators fault detection and isolation	---	18_ActuationFaults_Collisions.pdf (32) + 18_Rob2_Videos.zip (5)
Model-based torque control in industrial robots	---	TorqueFeedIndRob_VerdonckSwevers.pdf