

SOFT ROBOTS Course Outline

Total hours: 15 (6 + 6 + 3)

Thursday 15th (6h)

Morning session (3h + 0.5h):

(9:00 - 9:45) SG&CDS: *Round of presentations and information about the course*

(9:45 - 10:30) Stanislao Grazioso: *Modelling Soft Robots, part A: Continuum formulation of the dynamics*

(10:30 - 11:00) Break

(11:00 - 12:30) Stanislao Grazioso: *Modelling Soft Robots, part B: Discrete formulation with piecewise constant deformation*

Afternoon session (3h + 0.5h):

(14:30 - 16:00) Stanislao Grazioso: *Modelling Soft Robots, part C: Piecewise constant curvature as special case of the deformation space formulation*

(16:00 - 16:30) Break

(16:30 - 18:00) Cosimo Della Santina: *Controlling Soft Robots, part A: Soft robot's dynamics from the control point of view*

Friday 16th (6h)

Morning session (3h + 0.5h):

(9:00 - 10:30) Cosimo Della Santina: *Controlling Soft Robots, part B: Shape regulation and tracking*

(10:30 - 11:00) Break

(11:00 - 11:30) Cosimo Della Santina: *Controlling Soft Robots, part C: First steps in stabilization of unstable equilibria*

(11:30 - 12:30) Manolo Garabini: *Optimal Control of Articulated Soft Robots*

Afternoon session (3h + 0.5h):

(14:30 - 15:30) Alessandro De Luca: *Regulation, Inversion Control, and Feedback Equivalence for Flexible Robots*

(15:30 - 15:45) Mini - break

(15:45 - 16:45) Bruno Siciliano: *Force control for flexible robots*

(16:45 - 17:00) Mini - break

(17:00 - 18:00) Antonio Bicchi: *Planning and Learning Interaction with Variable Impedance.*

Saturday 17th (3h)

Morning session (3h + 0.5h):

(9:00 - 10:00) Cosimo Della Santina: *Controlling Soft Robots, part D: Control in task space*

(10:00 - 10:15) Mini - break

(10:15 - 11:15) Gianluca Palli: *Manipulation of flexible objects*

(11:15 - 11:30) Mini - break

(11:30 - 12:30) Giorgio Grioli: *Estimation of the Robot's stiffness*