



ROBOT CONTROL

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| Anno immatricolazione | 2020/2021 |
| Anno offerta | 2020/2021 |
| Normativa | DM270 |
| SSD | ING-INF/04 (AUTOMATICA) |
| Dipartimento | DIPARTIMENTO DI INGEGNERIA INDUSTRIALE E DELL'INFORMAZIONE |
| Corso di studio | INDUSTRIAL AUTOMATION ENGINEERING - INGEGNERIA DELL'AUTOMAZIONE INDUSTRIALE |
| Curriculum | PERCORSO COMUNE |
| Anno di corso | 1° |
| Periodo didattico | Secondo Semestre (08/03/2021 - 14/06/2021) |
| Crediti | 6 |
| Ore | 45 ore di attività frontale |
| Lingua insegnamento | English |
| Tipo esame | SCRITTO |
| Docente | FERRARA ANTONELLA (titolare) - 6 CFU |
| Prerequisiti | Knowledge acquired in previous courses in Automatic Control and Mathematical Methods in Engineering. |
| Obiettivi formativi | The course provides the basic methodological tools to model and control industrial robots. |
| Programma e contenuti | <p>Modelling of robotic systems: Structure of robotic manipulators. Classification. The joint space and the operational space. Direct kinematics. Inverse kinematics. Differential kinematics. Euler angles. Relationship between geometrical and analytical Jacobian. Dynamic modeling.</p> <p>Robot control: Planning. Motion control in the joint space (decentralized and</p> |

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| | centralized) and in the operational space (inverse dynamics). Interaction control: force control, hybrid force/position control. |
| Metodi didattici | Lectures (hours/year in lecture theatre): 45 Practical class (hours/year in lecture theatre): 0 Practicals / Workshops (hours/year in lecture theatre): 0 |
| Testi di riferimento | Lecture notes Robotics: Modelling, Planning and Control (Advanced Textbooks in Control and Signal Processing). Bruno Siciliano, Lorenzo Sciavicco, Luigi Villani, Giuseppe Oriolo. Springer. |
| Modalità verifica apprendimento | Closed-book, closed-notes, 2 hour written exam consisting of 3 sections assessing knowledge and understanding of the course topics and ability to apply them in a problem solving context. Each section will be independently graded. Threshold to pass is 18/30 an maximum mark is 30/30 cum laude. The final mark is obtained as the weighted mean of marks given to each section of the written exam. Example of a written exam: http://sisdin.unipv.it/labsisdin/teaching/courses/robcon/files/Robot_Control_Exam_Example.pdf |
| Altre informazioni | |
| Obiettivi Agenda 2030 per lo sviluppo sostenibile | \$lbl legenda sviluppo sostenibile |