

## Lista zagadnień na egzamin dyplomowy

Kierunek studiów:	<b>Automatyka i Robotyka</b>	Stopień studiów:	<b>pierwszy</b>
Specjalność:	<b>Robotyka</b>		

Nr	Zagadnienie
1	Ways to pass arguments to functions in C++. <b>[Information engineering]</b>
2	The role of the IP address in network communication. <b>[Information engineering]</b>
3	Basic laws of electrical engineering. <b>[Electrical engineering]</b>
4	Conservation laws in physics. <b>[Physics]</b>
5	Basics of wave optics (interference, diffraction, polarization). <b>[Physics]</b>
6	Normal stress - strength criterion, allowable stress, and factor of safety. <b>[Theoretical mechanics and mechanics of materials]</b>
7	Parameters of random signals. <b>[Signals and dynamic systems]</b>
8	Fourier transformation - its physical meaning and properties. <b>[Signals and dynamic systems]</b>
9	Controllers and control performance in a closed-loop system. <b>[Automatic control]</b>
10	Stability of linear continuous-time systems. <b>[Automatic control]</b>
11	Modelling of dynamical systems in discrete-time. <b>[Automatic control]</b>
12	Programming model for real-time systems. <b>[Real-time systems]</b>
13	Process synchronization and communication mechanisms. <b>[Real-time systems]</b>
14	Measurement uncertainty. <b>[Metrology]</b>
15	Sensors and transducers of non-electrical quantities. <b>[Metrology]</b>
16	Software and hardware implementation of combinational circuits. Minimization of logical expressions. <b>[Microprocessor systems]</b>
17	Software and hardware implementation, incl. multiplexers, demultiplexers, flip-flops and memory; software and hardware implementation of sequential circuits. <b>[Microprocessor systems]</b>
18	Peripheral systems (GPIO, TIM, ADC, DAC) of the microcontroller, their operation and hardware interfaces. <b>[Microprocessor systems]</b>
19	Direct and Inverse kinematics of robot manipulators. <b>[Robotics]</b>
20	Classification of methods for solving inverse kinematics of robot manipulators. <b>[Robotics]</b>
21	Robot manipulator dynamics model. <b>[Robotics]</b>
22	Robot control methods. <b>[Robotics]</b>
23	Hybrid force/position control of robots. <b>[Robotics]</b>
24	Design and manufacturing process of the Printed Circuit Board (from concept to manufacturing, assembly and testing). <b>[Electronical and electrical circuits designing]</b>
25	Basic system identification methods for ARX and OE structures (including model order estimation). <b>[System identification]</b>
26	Identifiability and parameter estimation in a closed-loop system. <b>[System identification]</b>
27	Determining models in the state space. <b>[Control theory]</b>
28	State observers. <b>[Control theory]</b>
29	Principle of operation of basic functional blocks of programmable controllers, timers and counters. <b>[Digital controllers and PLC]</b>
30	Cycle of operation of a programmable controller. <b>[Digital controllers and PLC]</b>
31	Communication mechanisms between nodes in Robot Operating System. <b>[Tools and software for robotic systems]</b>
32	Scientific libraries available in Python. Describe at least two of them. <b>[Tools and software for robotic systems]</b>
33	Components of multi-rotor flying platforms. <b>[Flying robots]</b>
34	Components of control algorithms of flying robots. <b>[Flying robots]</b>
35	Mechanical joints in machine design. <b>[Mechanical constructions]</b>
36	Motion commands of robot manipulators and their parameters. <b>[Robot programming and task planning]</b>
37	Kinematic singularities of robot manipulators. <b>[Robot programming and task planning]</b>
38	The purpose and limitations of using motion commands with approximate positioning. <b>[Robot programming and task planning]</b>
39	Tool calibration methods and their parameters. <b>[Robot programming and task planning]</b>

