Zagadnienia egzaminacyjne ELECTRONIC AND COMPUTER ENGINEERING

	TYP STUDIÓW	STOPIEŃ STUDIÓW	ZAGADNIENIA KIERUNKOWE

Zagadnienia egzaminacyjne ELECTRONIC AND COMPUTER ENGINEERING

(EAC) Electronic and Computer Engineering	*Stacjonarne*	**I-go stopnia**	1. Systematic and characteristics of direct methods of measurement and of methods for assessing measurement accuracy 2. Basic theorems in electronic circuits: Thevenin, Norton, superposition and power matching theorems. Application of Laplace transform in circuit analysis. 3. Principles of object-oriented design and their imp act on software quality. Compare the structural and object-oriented approaches of software development. 4. Bipolar and unipolar transistors -structure, properties and applications. Fundamentals of analog signal conditioning. 5. Printed circuit boards – substrates, layers, rules. Elements of cooling system of electronic devices 6. Name programming tools/environments applicable for dynamical systems simulation, give their short characteristics. Name typical tasks performed by scientists and engineers. Describe the differences in methodologies applied for scientific and engineering tasks elaboration. 7. What is an operational amplifier? Discuss its characteristic parameters. Give examples of applications. Construction and operation of PLL loops. Give examples of applications. 8. Problems of concurrent thread/process synchronization: synchronization criteria, available mechanisms, an example of the synchronization problem. Elements of object orienting programming in Java. 9. Basic telecommunication system: block diagram, coder/decoder, modulation/demodulation, Signal-to-Noise ratio 10. Describe techniques for optimization of logic equations. Microcontroller – describe main elements and how it works 11. Basic tasks of robotics: definition, solution techniques. Principles of modeling and models of wheeled mobile robots. 12. Enumerate and describe components of typical control loop. Describe operating principle and taxonomy of automatic controllers 13. Describe the ISO/OSI reference model and explain the principles of layered approach. Explain the differences between IPv4 and IPv6. 14. Acoustic waves - types, properties, equation. Electroacoustical chain. Distortions and disturbances 15. The physical basis of light amplification in lasers. Thermal and photonic detectors of light. 16. Describe main functionalities of a standard microcontroller's timer. How ADC works? What is meant by sampling, quantizing and encoding?

			17. *Discrete linear systems - the importance, a mathematical model, time and frequency properties of the model. Quadrature sampling scheme - Hilbert transform, analytical signal, quadrature sampling applications 18. *Methods of task and motion planning for stationary and mobile robots. Methods of localization and environment mapping for mobile robots 19. *Probabilistic knowledge representation and decision making methods. Low-level image processing algorithms - examples, applications 20. *Describe functional model of ARM microcontrollers. How the ARM microcontrollers stand again main families of 8-bit microcontrollers. Programming, debugging, tracing – explain what is meant by those terms and how are they realized in contemporary microcontrollers. 21. *Building management systems (BMS): architecture, equipment, communication protocols, Redundancy, High Availlibility and Safety Related aspects in Distributed Control Systems 22. *The review of lasing media. Describe one of chosen type of laser, its basic parameters and give an example of its application 23. *Wireless and radio systems: classification, applications, used frequency bands, network architectures and functions of individual 24. *HDL Hardware Description Languages: Verilog and VHDL. Components of the language. The structure of the code