

Applied Computer Science
Specialization: Computer Engineering

Zakres egzaminu dyplomowego

1. Postulates of research methodology.
2. Modern methods used in research methodology.
3. Modeling and meta-modeling.
4. Properties and scope of using UML.
5. Problems with models transformation and consistency.
6. Model-driven and quality-driven software development.
7. Use-cases, statecharts, sequence and activity diagrams.
8. Software life cycle, different approaches.
9. MDA approach to software development.
10. Basis of requirements engineering.
11. Patterns (architectural, design, program).
12. The effectiveness of information systems.
13. Modeling of complex operation systems.
14. The concept of decision-making system and computerized decision support system.
15. Modeling, identification, and aiding of decision making process.
16. Basic problems, methods and algorithms of discrete
17. Basic methods of "soft computing".
18. Rules for specification of the relational database model.
19. Rules for mapping class diagrams onto relational models.
20. The SQL 2003 standard.
21. Evolutionary Computation.
22. Introduction to machine learning, deduction versus induction.
23. Artificial neural networks.
24. Architecture of distributed and parallel systems, methods of parallel and distributed processing.
25. Grids and clusters. Exploitation and development problems.
26. Static and dynamic interconnection networks, typical topologies, different routing strategies.
27. Automatic program parallelisation, dependencies in sequential programs, identification of parallelism,
28. Evaluations of parallel systems: performance metrics, scalability of parallel systems, Amdhal, Gustafson and other laws.
29. Rule-based knowledge representations.
30. Knowledge based systems — inference mechanisms.
31. Incompleteness, inconsistency and uncertainty of knowledge.
32. Topologies of Computer Network.
33. Internet and Web services Architecture. Web and P2P systems.
34. Measurement, estimation and prediction of communication time in the Internet.
35. The Web Server model. Access and scheduling algorithms for HTTP requests in a Web Server.
36. Differences between IPv4 and Ipv6.
37. Multimedia technologies used in information systems.
38. Processing and access to multimedia data.
39. Designing of multimedia interface of computer applications.
40. Methods, techniques and tools used for designing and construction of mobile systems.