Entry Exam Questions for international students
applying for
27.04.04 Digital Control Systems

---

1. Root and algebraic stability criteria for linear continuous systems.
2. Logarithmic amplitude-frequency and phase-frequency characteristics.
3. Mathematical models ("input-state-output" and "input-output") of continuous control systems' motion description.
4. Lyapunov method for continuous systems stability studying.
5. Full-order observers and an Luenberger observer of the linear dynamic systems states.
6. Modal control method for controllers synthesizing.
7. PID controller parameters tuning using the Ziegler and Nichols method.
8. Control systems quality indicators: dynamic, accuracy, and indirect indicators.
9. Typical dynamic blocks and its properties.
10. Structural transformations of the consecutive and parallel connection blocks and blocks with feedback.
11. Structural properties of mathematical models: controllability and observability. Criteria for controllability and observability for continuous systems.
12. The concept of transfer function and transfer matrix of a continuous system.
13. Stability analysis of a discrete systems.
14. Discretization of continuous signals.
15. Nyquist sustainability criterion.
16. Astatism order evaluation of closed system transfer functions.
17. Transition and weight functions of a continuous systems.