Mandatory courses in informatics

- Algorithms and data structures
- Computer architecture
- Social and professional challenges of computer science
- Software engineering
Mandatory courses in informatics

- **Algorithms and data structures**
  - sorting, searching, graph algorithms, dynamic programming, greedy algorithms, heuristics, …
  - binary trees, heaps, priority queues, hash tables, graphs, …
  - complexity, P, NP, NPC, NPH problems, …

- **Computer architecture**

- **Social and professional challenges of computer science**

- **Software engineering**
Mandatory courses in informatics

- Algorithms and data structures
- **Computer architecture**
  - CISC and RISC architecture
  - superscalar architecture
  - parallel computers
  - matrix computers: SIMD
  - CUDA framework
  - multithread SIMT
  - massively parallel computers – MPP
  - (non-)uniform memory access – NUMA, UMA
  - high-performance clusters
- Social and professional challenges of computer science
- Software engineering
Mandatory courses in informatics

- Algorithms and data structures
- Computer architecture
- Social and professional challenges of computer science
  - professional and ethical responsibility
  - ethical codes and codes of conduct
  - computer systems risks and responsibilities
  - intellectual property rights: legal issues and regulations, patents
  - fundamentals of privacy
- Software engineering
Mandatory courses in informatics

- Algorithms and data structures
- Computer architecture
- Social and professional challenges of computer science
- **Software engineering**
  - process of software production
  - programming paradigms: waterfall, spiral, agile, …
  - object-oriented design
  - system modelling with Universal Modelling Language (UML)
  - SOLID: design principles for flexible and maintainable software
  - optimisation of code
Courses to choose

- Introduction to programming in Java
- Programming for the Java platform, enterprise edition
- Programming of mobile devices
- Software Defined Radio Systems
- Internet of Things
- Design and configuration of LAN infrastructure
- Security of network user’s environment
Courses to choose

- Introduction to programming in Java
  - Java versus C++
  - object-oriented programming in Java
  - collections and design patterns in Java
  - unit testing JUnit library
  - introduction to standard edition and enterprise edition

- Programming for the Java platform, enterprise edition
- Programming of mobile devices
- Software Defined Radio Systems
- Internet of Things
- Design and configuration of LAN infrastructure
- Security of network user’s environment
Courses to choose

- Introduction to programming in Java
- **Programming for the Java platform, enterprise edition**
  - object-relational mapping frameworks
  - database applications
  - web applications and servlets
  - from distributed computing to service-oriented architectures
  - asynchronous JavaScript
  - design patterns for Java EE platform
- Programming of mobile devices
- Software Defined Radio Systems
- Internet of Things
- Design and configuration of LAN infrastructure
- Security of network user’s environment
Courses to choose

- Introduction to programming in Java
- Programming for the Java platform, enterprise edition
- Programming of mobile devices
  - architecture of mobile devices
  - desktop and mobile applications
  - Linux, Windows
  - multithreaded applications
  - security of applications and systems
- Software Defined Radio Systems
- Internet of Things
- Design and configuration of LAN infrastructure
- Security of network user’s environment
Courses to choose

- Introduction to programming in Java
- Programming for the Java platform, enterprise edition
- Programming of mobile devices
- **Software Defined Radio Systems**
  - hardware (eg mixers, filters, amplifiers, modulators, demodulators, detectors, etc.) implemented as software
  - radio signal transmission
  - analogue to digital and digital to analogue conversion
  - digital filters
  - methods of modulation
  - antennas
  - SDR software
- Internet of Things
- Design and configuration of LAN infrastructure
- Security of network user’s environment
Courses to choose

- Introduction to programming in Java
- Programming for the Java platform, enterprise edition
- Programming of mobile devices
- Software Defined Radio Systems
- Internet of Things
  - IoT hardware
  - networking in IoT
  - IoT cloud
  - programming for IoT
  - natural language processing
  - semantic web
  - audio, video and image processing in IoT
- Design and configuration of LAN infrastructure
- Security of network user’s environment
Courses to choose

- Introduction to programming in Java
- Programming for the Java platform, enterprise edition
- Programming of mobile devices
- Software Defined Radio Systems
- Internet of Things
- Design and configuration of LAN infrastructure
  - LAN infrastructure
  - classical Ethernet
  - virtual networks
  - wireless LAN connections
  - LAN systems IP configuration
  - protocols
- Security of network user’s environment
Courses to choose

- Introduction to programming in Java
- Programming for the Java platform, enterprise edition
- Programming of mobile devices
- Software Defined Radio Systems
- Internet of Things
- Design and configuration of LAN infrastructure
- **Security of network user’s environment**
  - system and data security
  - threats to user data
  - protection from data loss
  - protections from unauthorized access, stealing of data
  - confidentiality of data on mobile devices
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