- Algorithms
  - Loop invariants
  - Analysis
  - Sorting (including shell sort, merge sort, quick sort, and heap sort)
  - Experimental evaluation
- Object-oriented programming in Java
  - Java Collections
  - UML
  - Design principles
  - Inheritance
  - Nested classes
  - Generics
  - Design patterns (Factory Method, Template Method, Iterator, Mediator, Strategy, State, Adaptor, Decorator)
- Data structures
  - Abstract data types
  - Linked structures
  - Lists, sets, maps
  - Stacks
- Queues
- Binary trees
- Heaps and priority queues
- Hashing
- Concurrency
  - Threads
  - Race conditions and deadlocks
  - Locks and monitors
  - Threading and Swing
- C programming
  - Basics
  - Preprocessor and makefiles
  - Structs
  - Dynamic memory
  - Pointers
  - Bit operators
  - Function pointers
- Systems
  - Computer memory
  - Logic gates and circuits
  - Pseudo-assembly
  - Function call and return