General outline

X   For total newbies

X   Number systems

X   How computer works

X X X OOP - much simplified introduction

XXX X JavaFX GUI, much simplified introduction

XXX X Java Basics

XXX X   Basic Syntax: Classes, Data Types, Variables, Operators

XXX X   Decision Making

XXX X   Loops - for, while and do...while

XXX X   Methods

XXX X   Classes

XXX X   Numbers Class

XXX X   String Class

XXX X   StringBuffer & StringBuilder Classes

XXX X   Math Class

XXX   Recursion

X   Date & Time

X   Regular Expressions

X   Streams, Files and I/O

X   Exceptions Handling

XXX X Graphic UI JavaFX

X   Theory of Algorithms, Complexity of Algorithms

X   Mathematical Algorithms

X   Multiplication of Matrices

X   The greatest common divisor (GCD)

X   The least common multiple (LCM), Euclid's algorithm

X   Factorial, Recursion, Factorization

X   Fibonacci sequence

X   Algorithm Fisher-Yates

X X Basic Data Structures

X X   Queue

X X   Stack

X X   Heap

X X   Tree

X X Graphs and graph algorithms

X X   Terminology, writing, theory

X X   Breadth-first Search, BFS

X X   Depth-first Search, DFS

X X   The minimum spanning tree

X X   MiniMax

X X Topological arrangement, Floyd algorithm

X X Trees
X X Terminology. The implementation by field, by heap, dynamically
X X Hufmann tree
X X Binary trees: search, insertion
X X AVL trees: search, insertion
X X AVL trees: rotation
X X 2-3-4 trees
X X 2-3 trees
X X B-trees
X X red-black trees

X Lists
X Linear linked list
X Insert to the beginning, to the end
X Inserting after the bookmark, before the bookmark
X Deleting after the bookmark, on the bookmark
X Special lists

X Searching
X Direct
X Linear
X Bisection
X Hashing Method

X Search in text
X Terminology, Hamming distance

X Trivial algorithm
X KMP

X Sorting
X BubbleSort
X ShakeSort
X ShellSort
X InsertSort
X QuickSort

X Sorting in linear time
X CountingSort
X BucketSort

X X Cryptography
X X Historical ciphers
X X Finding primes, Factorization
X X Symmetric ciphers
X X Asymmetric ciphers, RSA, MIM attack
X X Practical use: keys, certificates, signing
X X Quantum cryptography

XX OOP
XX Primitive and reference types, comparison, copying
XX Overload vs Override
XX Inheritance
XX Overriding
XX Polymorphism

- Abstraction
- Encapsulation
- Interfaces
- Abstract classes

- Java 2
  - Packages
  - Data Structures
  - Collections Framework
  - Generics
  - Serialization
  - Networking (Socket Programming)
  - Sending Email
  - Multithreading
  - Synchronizace vláken
  - Interthread Communication
  - Thread Deadlock
  - Thread Control
  - Applet Basics
  - Java Documentation