

First course (1-2 months) - basic concepts (js, java, c, low-lvl):

- 1) Standard Out – hello world, logging
- 2) Primitive variables – types, definition, assignment, arithmetic operations
- 3) Conditional statements – ==, !=, <, >, <=, >=, if, if/else, if/else-if/.../else, switch
- 4) Standard In – read number, read string, EOL symbol
- 5) Procedures – definition, arguments, return, local and global variables
- 6) Functions – definition, return type
- 7) Loops – definition, while, do-while, for
- 8) Objects – classes, objects, pointers/references, null
- 9) Arrays – definition, allocating, indexes, length, out-of-range
- 10) Strings – char[], substring, trim, equals, case, ascii-table
- 11) Files – encoding/decoding, extensions, paths, reading/writing, logging to file
- 12) Course work and exam

Second course (1-2 months) - structures and algorithms (js, java, c, low-lvl):

- 1) Arrays – min/max, inverse, even/odd walk, mirror, equals, linear search, binary search
- 2) Complexity – big O, o(n), o(n²)
- 3) 2D arrays – columns and rows, NxN, NxM, Nx?, column walk, row walk, snake walk
- 4) Arrays – bubble sort, insertion search
- 5) Strings – inverse, equals, substring, palindrome, indexOf/replace (first/last/all)
- 6) Pointers – memory model, pointers arithmetic, casting
- 7) Mutable and Immutable – concept, pass-by-value, pass-by-reference
- 8) Lists – linked list, dual-linked list, search, insert, delete
- 9) Set – concept, put, contains, set vs sorted set
- 10) Queue/Stack – concept, FIFO, LIFO
- 11) Map – concept, list of pair
- 12) Recursion – recursion vs loop, on-up, on-down, on-up-down, quick sort
- 13) Tree – theory, binary tree implementation
- 14) Course work and exam

Third course (1 month) – front-end basics (html, css, js, java):

- 1) Swing part 1 – form, components, button, label, textbox, events
- 2) Project Notepad
- 3) Swing part 2 – checkbox, radio button, list, table, dialogs
- 4) Common text data formats – csv, json, xml
- 5) Project ContactBook
- 6) Project MiniPiano
- 7) Web part 1 – HTML tags: [html, div, p, span, input], DOM, id, class, css, onclick, onchange
- 8) Web part 2 – local storage, Bootstrap, jQuery
- 9) Project WebContactBook
- 10) Project WebPaint
- 11) Exam

Forth course (1 month) – back-end basics (js, java, low-lvl):

- 1) Networking – OSI model, DNS, hosting, client-server architecture
- 2) Socket – concept, Server-Socket, Client-Socket, echo server
- 3) Threads – concept, sync/async, new Thread, producer/consumer
- 4) Project SocketChat
- 5) HTTP – concept, GET, POST, URL, URLConnection, AJAX
- 6) Project WebChat (rest server + web front-end)
- 7) SOAP – concept, wsdl, jax-ws
- 8) REST – RESTful definition, swagger/wadl, jax-rs
- 9) Exam

Fifth course (1 month) – persistence basics (sql, java):

- 1) Databases – DB definition, DBMS, SQL, PostgreSQL
- 2) Relation DB theory – ERM diagram, one-one, one-many, many-many, normal forms
- 3) SQL read – select *, where, like, count, min/max, group by, having
- 4) SQL create – insert, create table
- 5) SQL update – update, alter table
- 6) SQL delete – delete, drop table/database
- 7) Project CoffeShop – design DB
- 8) JDBC – concept, Connection, executeQuery, execute, prepared statements, ResultSet, DAO/DTO
- 9) Project CoffeeShop – jdbc implementation
- 10) JPA – ORM, EntityManager, persistence.xml, JPQL, CriteriaAPI
- 11) Transactions – theory, sql level, jdbc level, jpa level
- 12) Project CoffeeShop – jpa implementation
- 13) No-SQL – concept, Redis, MongoDB
- 14) Exam

Sixth course (1 month) – mature programming (js, java):

- 1) Maven – pom.xml, dependencies, mvn goals
- 2) Testing – unit tests, integration tests
- 3) VCS – git, svn
- 4) Best practices – naming, logging, KISS, SOLID
- 5) Functional programming – pure functions, immutability, scalability
- 6) Interfaces – concept, Anonymous classes, Lambdas
- 7) StreamAPI – stream, map, filter, collect, flatMap...
- 8) Multithreading – ThreadPool, Future, Callback
- 9) Patterns – concept, GoF patterns
- 10) Spring – IoC/DI, Spring Data, Spring MVC, Spring Security
- 11) Java EE – jax-rs, jax-ws, jaxb
- 12) Modern JS – Angular, Node.js, React
- 13) Project Rozetka
- 14) Exam
- 15) Writing CV
- 16) ...
- 17) At this point you are Intern/Junior Java Developer