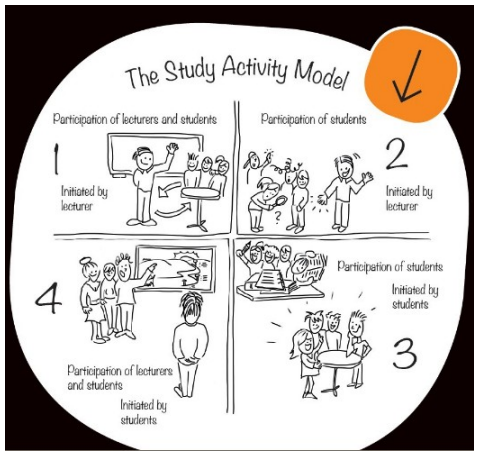
Study activities in Programming



Totals for Programming: 275 hours
Below you will find the details in relation for study activities for programming.

K1 activities: 110 hours

This includes teacher-centred education, which accounts for about 69 hours and guidance of students about 41 hours.

K2 activities: 150 hours

Preparation time and exercises as a K2 activity accounts for about 150 hours. This also includes project work.

K3 activities: 10 hours

The K3 activities account for 10 hours, which include self-study and knowledge sharing.

K4 activities: 5 hours

5 hours for process and profession guidance

Subject to change!
2nd semester – Spring 2018, ***dmab0917***

Course contents::
Databases:
Introduction to relational databases and the SQL language
Introduction to using SQL from Java (”embedded SQL”)

Data structures and algorithms:
Introduction to graphs and graph algorithms

High order functions and lambda expressions:
Lambdas in Java

Parallel programming and streams in Java:
Threads – Thread, Runnable, Synchronized, etc.
Stream framework

Software design patterns, e.g.:
Composite Pattern
Observer Pattern
Visitor Pattern
State Pattern (State machines and regular expressions)

Session	Subjects	Readings and other Materials
1 2018 02 05	Introduction to MS SQL Server Introduction to database systems, Concepts, terminology, and architecture The relational model	Elmasri 1, 2, 5
2 2018 02 12	Relational Algebra Introduction to SQL Embedded SQL.	Elmasri: Chap. 5, 6, 8.1, 8.2, 8.3.1, 8.3.2 + overview p. 288
3 2018 02 14	Embedded SQL. More about SQL.	Elmasri: Chap. 6, 7.1, 7.3, 7.4
4 2018 02 16 F	Embedded SQL. Architecture. Design Patterns related to Database Access	Elmasri: Chap 10.1, 10.3.2 Lecture note: Persistence, An example for Encapsulation of Database Access in Java Systems CompanyCode
X 2018 02 26 2018 02 27	Workshop QA Day 1: LRL, Day 2: KNOL	
5 2018 03 01	Embedded SQL. Architecture. Design Patterns related to Database Access Transactions, prepared statements	Elmasri: Chap 10.1, 10.3.2 Lecture note: Persistence, An example for Encapsulation of Database Access in Java Systems CompanyCode
6 2018 03 08	Architecture + summing up SQL (Transactions, prepared statement)	
X 2018 03 13 2018 03 19	Mini Project Persistence Hand-in: 2018 03 19	
X 2017 03 21	Evaluation of Mini Project Persistence	
7	Data structures 1:	Chapters in parenthesis are recap from 1. Semester.

2018 04 09	Review (dynamic vs. static, hashing) Efficiency Trees and Composite Pattern	Carrano, chap. (1, 2, 3, 5, 21, 22, 23, 24, 25 + Interlude 1 (generics)) Carrano, chap. 4 Carrano, chap 23, (24, 25, 27 (only 2-3 trees)) Larman, chap. 26.8
8 2018 04 12	Data structures 2 Graphs, concepts, terminology, applications and representation	Carrano, chap. 28, 29
9 2018 04 17	Data structures 3: Graph algorithms Algorithm patterns	Carrano, chap. 28 Lecture notes: Algorithm Patterns, DivideAndConquer, Dyna-progr, GreedyEng
10 2018 04 19	Data structures 4: Implementation of graphs.	Carrano, chap. 29
11 2018 04 20 F	Patterns 1 State machines, state pattern and regular expressions	Slack: Carrano, pp 351, 355, chap. 26 Patterns 1: Lecturenote or: Grand pp. 357-364
12 2018 04 25	Patterns and lambdas Visitor and observer pattern	http://docs.oracle.com/javase/tutorial/java/javaOO/lambdaexpressions.html Grand pp. 347-356, 385-395 or: Urma: http://it-ebooks.info/book/4428/ (relevant parts of chapter 1 – 5).
13 2018 05 01	Parallelism 1	https://docs.oracle.com/javase/tutorial/collections/streams/index.html
14 2018 05 03	Parallelism 2 – Lambdas, streams and parallel streams	https://docs.oracle.com/javase/tutorial/collections/streams/reduction.html https://docs.oracle.com/javase/tutorial/collections/streams/parallelism.html

Elmasri:

Ramez Elmasri, Shamkant B. Navathe: Fundamentals of Database Systems. Seventh Edition. Pearson 2017Ramez

Carrano:

Timothy M Henry, Frank M. Carrano: Data Structures and Abstrations with Java, fourth edition, global edition. Pearson 2016.

Larman:

Craig Larman: Applying UML and patterns, 3rd Edition. Prentice-Hall 2005.

Grand:

Mark Grand: Patterns in Java, Vol. 1. Wiley 1998.

Urma:

Raoul-Gabriel Urma, Mario Fusco, Alan Mycroft: Java 8 In Action, Hanning 2015

Lecture notes:

Finn E. Nordbjerg:

Algorithm Patterns
OOD-Inheritance
DivideAndConquer
Dyna-progr
GreedyEng
RegExState

Lecture note

Persistence Architecture