ELEC-E7240 Coding Methods P (5 cr) spring 2019

Lectures

Professor John Dunlosky and colleagues studied ten learning techniques commonly used by students. The two best techniques turned out to be (for more details, see https://www.aft.org/sites/default/files/periodicals/dunlosky.pdf)

- practice testing and
- distributed practice.

These are about small regular tests and about spreading out studying over time—not just putting on a spurt before the exam. Others, like rereading, summarization, highlighting, and underlining, are less effective techniques. These observations have been taken into account in developing and transforming the current course.

The lectures take place on Mondays 12–14 (in AS6, Maarintie 8) and Wednesdays 10–12 (in Simulointilaboratorio, OIH). Practice testing will take place in the beginning of the lectures, so you must arrive **within five minutes of the start** of the lecture (Mo: 12.20; We: 10.20).

Date	Topic	Preparation
07.01	Introduction	1–24
09.01	Algebra I	25–52 (A1)
14.01	Algebra II	53–72 (A2)
16.01	Linear Codes I	73–99 (A3)
21.01	Linear Codes II	100–127 (A4)
23.01	Cyclic Codes	128–155
28.01	BCH and Reed-Solomon Codes	156–173 (B1)
30.01	Convolutional Codes I	174–201 (A5)
04.01	Convolutional Codes II	202–231 (B2)
06.02	Modern Coding Methods I	232–267 (A6)
11.02	Modern Coding Methods II, Channels with Feedback	268–298
13.02	No lecture (spare lecture slot)	
20.02	Exam (16.30–19.30)	

All but three of the lectures either have a pre-assignment or start with a small test. The pre-assignments and tests are numbered B1–B2 and A1–A6, respectively, in the table above and the seven best count. Before the lecture, the student is assumed to have studied the pages of the slides listed in the table. The course book can obviously be consulted for more details.

Exercises

The exercises take place Thursdays 14–16 (T5, Konemiehentie 2; except for the first exercise, which is in A116, Maarintie 8). The exercises consist of homeworks and

tutorials. The homeworks are graded and the total number of points is obtained from the percentage of correct solutions divided by 10 (that is, maximum is 100/10 = 10 points). Moreover, there will be programming tasks that can give up to 3 bonus points.

Date	Topic	Homework deadline
10.01	Introduction	No homework
17.01	Abstract algebra	17.01
24.01	Linear Codes	24.01
31.01	Cyclic, BCH, Reed–Solomon Codes	31.01
07.02	Convolutional Codes	07.02
14.02	Turbo codes, LDPC codes	14.02

Grading

The course can be passed in two ways, via **activity points** and via **exam only**. The alternative based on activity points supports learning best. However, for students that for one reason or another are not able to attend the events, the exam-only alternative is an option. Note that the exam is included, and **mandatory**, in the activity-points alternative. Each student essentially gets two grades for these two alternatives; the better counts.

The maximum amount of points in the exam is 24. The grading for the exam only is as follows:

Grade	Points
0	0–9
1	10–12
2	13–15
3	16–18
4	19–21
5	22–24

The maximum amount of activity points is 48: 24 (exam) + 14 (lectures) + 10 (homeworks). **Note!** To pass the course, the amount of exam points must be at least 6. Grading:

Grade	Points
0	0–13.5
1	14–20.5
2	21–27.5
3	28–34.5
4	35–41.5
5	42–48

Exam

There are exams on 20.02.19 and 06.05.19.