EITG05 – Digital Communications

(Previously: ETT051)

Course Information

Michael Lentmaier
Monday, September 3, 2018

Lectures

- **Teacher:**

  Michael Lentmaier, michael.lentmaier@eit.lth.se, E:2375

  Mondays 10.15 – 12.00 in MA 4
  Thursdays 10.15 – 12.00 in E:B

- **Course webpage:**

  `http://www.eit.lth.se/course/EITG05`

  - Slides from the lectures will be posted each week
  - Please check messages on this page regularly

- **Course administrator:**

  Anne Andersson, anne.andersson@eit.lth.se, E:3152b

Exercises

There are two groups of exercise classes:

- **Group A:** (priority for C students)

  Wednesdays 10.15 – 12.00 in E:2311
  Fridays 10.15 – 12.00 in E:2517

- **Group B:** (priority for MWIR students)

  Wednesdays 13.15 – 15.00 in E:2517
  Fridays 8.15 – 10.00 in E:1144

- If there is enough space in the rooms you can choose the group you prefer (otherwise see priorities above)
- **Instructor:**
  Muhammad Umar Farooq,
  muhammad.umar_farooq@eit.lth.se, E:2367
- **All exercises are held in English**

Examination / Laboratory

Final Exam

- Written exam
- Thursday, Novemver 1, 2018, 14.00 – 19.00 in MA 10A–E
- Five problems with 10 points each
- 20 points or more are required to pass

Laboratory

- Two laboratory lessons are included in the course (mandatory):
  Lab 1 in study week 3, Lab 2 in study week 7
- Each lab lesson takes 2 hours
- Reservations of the lab times are made online (not open yet)
- More information, including the instructions, will be posted (check the messages on the course webpage)

New this year: Lab starts in study week 3

Course Literature

The course is based on the compendium:

"Introduction to Digital Communications"
by Göran Lindell, August 2006

Available at KFS bookstore in the LTH study center

- **You are allowed to use the compendium in the written exam!**
- The parts of the compendium which are related to the different lectures are defined in the course outline, which is available on the webpage (*Lecture* section)
- Problems to be solved in the exercises will be posted weekly
  New this year: some new problems (not from compendium)

Course Outline

Course outline: (preliminary version, may slightly change during the course)

Cal. Week	Lecture	Topic	Compendium	Slides
36	Mon, Sep 3	Course information Introduction, Overview, Basic concepts	pages 1-32	
	Thu, Sep 6	Signal constellations, PAM, PSK, FSK, PPM, QAM, PWM, OFDM	p. 31-55	
37	Mon, Sep 8	Bandwidth of the transmitted signal, Fourier transform, R(f) M-ary and binary, Bandwidth	p. 61-72, 77-88	
	Thu, Sep 11	Bandwidth of the transmitted signal, R(f) for PAM, QAM, OFDM and FSK signals	p. 88-102	
38	Mon, Sep 17	Receivers in digital communication systems, Basic concepts, Minimum Euclidean distance receiver Matched filter receiver, Performance binary signaling No Thursday lecture because of first laboratory	p. 227-254	
39	Mon, Sep 24	Receivers continued: System design criteria, Performance for M-ary signaling	p. 254-286	

New this year: receivers (Chap. 4) before carrier modulation (Chap. 3)

Some advices

- Attend the lectures and exercises (voluntary but useful)
- Spend some time before/after the lectures to review the material
- Work with the compendium and the lecture slides
  (both are allowed within the exam)
- Lectures/exercises/labs are more efficient if you are prepared

Time plan:

1. Lectures: 24 hours (12 lectures within 7 weeks)
2. Exercises: 28 hours (2 sessions each week)
3. Laboratories: 4 hours (two labs, 2 hours each)
4. Time for self-studies: 144 hours (7.5 credits = 200 hours)

Hence you could learn 6 days á 24 hours before exam = 144 hours
(I do not recommend this strategy, you need some sleep as well!)

Course Representative / Kursombud

We are looking for

- Two students from the C program
- One student from the MWIR program
- Other program representatives welcome if there is interest

If you are interested, please get in touch with me in the break