

# DIGITAL TECHNICS

## Course description

### Aims and scope

This course will give an overview of the basic concepts and applications of digital technics, from Boolean algebra to microprocessors. The material covered roughly corresponds to that contained in the introductory three semester course of the Hungarian language B.Sc. programme. However in many respects it will go into deeper depths. The lectures will focus more on the general concepts of the subject and less on the practical details. In that respect it is presupposed that the students have already a certain level of hands-on experience in digital electronics.

### Course contents

1. Boolean algebra, logic operations and functions.
2. Combinational logic circuits, analysis and synthesis.
3. Combinational design: case studies.
4. Number systems and codes.
5. Arithmetic circuits.
6. Sequential logic circuits, synchronous and asynchronous.
7. Flip-flops, registers, and counters
8. Sequential logic circuit design: case studies.
9. Logic gates and logic circuits families.
10. CMOS logic circuits, basic principles and design examples.
11. Digital data transmission and bus systems.
12. Semiconductor memories.
13. Microprocessor basics.

### Recommended literature

Arató Péter: Logikai rendszerek tervezése, Tankönyvkiadó, Budapest, 1990, Műegyetemi Kiadó 2004

Gál Tibor: Digitális rendszerek I. és II. Műegyetemi Kiadó, 2003, 51429, 514291

Benesóczky Zoltán: Digitális tervezés funkcionális elemekkel és mikroprocesszorokkal, Műegyetemi Kiadó, 2002, 55033

Mojzes Imre (szerk.) Mikroelektronika és elektronikai technológia, Műszaki Könyvkiadó, Budapest, 1995

### Web sources

Pődör Bálint: Digital technics (course materials), [vill.prociweb.hu](http://vill.prociweb.hu)

Tóth Mihály: 1. A Revision of Combinational Circuits, 2. Number Systems and Codes (short version), 3. Number Systems and Codes (long version), 4. Kódolás, 5. Sorrendi hálózatok 1 (flip-flopok), 6. Sorrendi hálózatok 2 (szinkron szekvenciális hálózatok), [szgti.bmf.hu/~mtoth/](http://szgti.bmf.hu/~mtoth/)

### Coursework and grading

1. home assignment: combinational logic problem solving (20 % weight in the final grade).
  2. home assignment: sequential logic design (30 % weight in the final grade).
- End-of-semester test paper (50 % weight in the final grade).

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