### Digital Logic Design 4. - IVB037ANVM

Lecture/Practice/Lab: 2/2/0

Credit points: 4

Requirement: Exam

Semester: Spring, 6/7

Prerequisites: Digital Logic Design 2.

Lecturer: Zsolt Kisander

Department: Department of Automation

This subject provides an introduction to digital signal processing, with the necessary mathematical and programming background to start to develop engineering applications.

#### Lecture topics

Lecture topics follow the recommended textbook’s chapters.

1. Review of discrete-time signals and systems
2. Mathematical representations
3. Analog versus Digital comparison
4. z-transform, properties and application of z-transform
5. Sampling of continuous-time signals
6. Transform analysis of LTI systems
7. Structures for Discrete-time systems
8. Filter design techniques
9. Discrete Fourier Transform
10. Parametric signal modeling

#### Practice topics

1. Programming basics
2. Computer representation of signals
3. Descriptive signal properties
4. Signal visualization
5. Transforming between time and frequency domains
6. Filter definitions and filtering
7. Feature extraction
8. ML-based techniques

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#### Midterm requirements and fulfillment

Students must be present on more than 70% of contact classes and/or consultations. Having more than 30% absence results in signature refusal.

Midterm assessments:

* One written test after the 10th week (lecture topics). The exact schedule will be voted on by the students.
* One design project homework (practice topics). The deadline is the 15th week.

Students have to complete each assessment with a passing grade to get the signature and the midterm grade. The midterm grade is the arithmetic mean of the assessment results.

| Mark | 5 | 4 | 3 | 2 | 1 |
| --- | --- | --- | --- | --- | --- |
| Grade | Passing | | | | Failed |
| Limits (%) | 85 | 70 | 55 | 40 | < 40 |

#### Exam requirements

Students who pass midterm requirements are eligible to take the exam (oral). The exam topics follow the Lecture topics and the up-to-date exam topics will be available after the spring break.

#### Failing the requirements

The Code of Studies and Examinations of the University of Pécs is applicable in general.

* Students have one midterm test retake opportunity before the exam period.
  + Schedule: 15th week’s lecture
  + Format: same as the test
* Students without signature have one opportunity to earn a passing midterm grade and signature in the exam period.
  + Schedule: 1st week of the exam period, lecture time
  + Format: written test and a new homework with oral presentation

#### Recommended literature

Discrete-Time Signal Processing 3rd ed., Alan V. Oppenheim; Ronald W. Schafer, 2014.