Obuda University John von Neumann Faculty of Informatics			Institute of Applied Informatics	
Name and code: *Basics of Information Systems* (NIRIA1SEND) **Credits*: 3*** *Computer Science and Engineering BSc specialty* *Full-time, 2013/14 year I. semester*				
Subject instructors: Dr. László Kutor, Dr. Levente Kovács				
Prerequisites (with code):				
Weekly hours:	Lecture: 3	Seminar.: 0	Lab. hours: 1	Consultation: 0
Way of assessment:	midterm grade			

Course description:

Goal: The goal of the course is to give an introduction to MATLAB and to familiarize the students with the most important concepts, relations and trends in information systems. Moreover, it stimulates the students' overall interest in informatics.

Course description: The first objective is to familiarize the students with the MATLAB engineering software and to acquire skill in using it from hands-on practice. Simple solutions will be highlighted, which provide an opportunity for students to deepen their knowledge in mathematics as well as to gain the knowledge needed to solve mathematical problems in future courses as well. Practice topics: function-representation, function approximation, graphical display of computational errors and overflows; digitalization and sampling procedures and their graphical representation; compression functions and their representations; signal filtering (mean, median, sliding window screening).

During two-thirds of the semester, the most important concepts of informatics are presented together with the basic knowledge of a computer terminology. The most important factors and theoretical concepts in the development of information technology are highlighted, as well as the place of information technology in other research fields. Topics include: characteristics of the "Neumann-based" computer architecture features and future development plans; basic concepts of coding; information representation (numbers, characters, images, music); interpretation of minimum redundancy codes, key encryption algorithms; the principle of dictionary-based data compression, commonly used coding system algorithms; adaptive coding principles and their significance; the principles of fault tolerance and error correction systems and typical examples (SED SEC Hamming code).

Lecture schedule	
Education week	Topic
1.	Matlab basics I.
2.	Matlab basics II.
3.	Matlab basics III.
4.	Basics of information technology, trends in development, information-processing paradigms.
5.	Signal types, their representation. Analog-digital conversion.
6.	Binary representation of integers and rational numbers.
7.	The representation and measurement of information. The concept of redundancy and its measurement.

8.	1st midterm test. Minimal redundancy code. Statistical-based compression algorithms.
9.	Dictionary-based data compression algorithms.
10.	Channel coding principles and practices. Basics of fault-tolerant systems.
11.	Early devices for counting. The development of modern computers.
12.	Hungarian pioneers of information technology, their work and their importance.
13.	Consultation 2nd midterm test.
14.	Make-up midterm test.

Practice schedule	
Consultation	Topic
1.	Function representation.
2.	Function approximation
3.	Midterm test 1 Number representation.
4.	Digitalization.
5.	Compression and filtering techniques.
6.	Midterm test 2. Make-up test opportunity.

Midterm requirements

Midterm tests

Education week	Topic
5.	1st test - practice. (Matlab) Week A
6.	1st test -practice. (Matlab) Week B
8	1st midterm test – theory (preparation questions I.)
11	2nd test – practice Week A
12	2nd test – practice Week B
13	2nd midterm test – theory (preparation questions II) Make up test – practice (Matlab) Week A
14	One make-up midterm test- theory Make-up test – practice (Matlab) Week B

2014. 03. 05.

Final grade calculation methods

The grade is formed equally from the results of the two parts – practice and theory. A minimum of 50% must be achieved in each part.
The midterm grade is the % average of the two parts as follows:

Achieved result	Grade
89%-100%	excellent (5)
76%-88<%	good (4)
63%-75<%	average (3)
51%-62<%	adequate (2)
0%-50<%	insufficient (1)

Type of exam

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Type of replacement

Only one make-up test in theory is offered. Make-up tests for the practice part are possible only if the absences do not exceed that allowed by the rules (TVSZ).

Make-up tests for insufficient midterm grades can be taken in the first 10 days of the examination period, at a given time and on eMax system. Make-up tests need only be taken in the part (MATLAB, or theory) where the minimum of 50% was not achieved. The final grade is calculated in the same manner as the midterm grade.
If make-up tests are needed in both parts, the last obtained results will be used to calculate the final grade.

References

Obligatory:

The electronic material from the web-page.

Recommended:

http://uni-obuda.hu/users/kutor/
http://mobil.nik.uni-obuda.hu/

Other materials:

On the webpage of the lecture.