COURSE SYLLABUS AND COURSE REQUIREMENTS
ACADEMIC YEAR 2024/25 SEMESTER SPRING

Course title	*Introduction to Computer Science*
Subject Code	IVB014ANMI, IVB365ANMI
Hours/Week: le/pr/lab	2/0/0
Credits	3
Degree Programme	Computer Science Engineer
Study Mode	*Full time*
Requirements	exam
Teaching Period	spring
Prerequisites	No prerequisities
Department(s)	Department of Engineering Mathematics
Course Director	*Ákos PILGERMÁJER*
Teaching Staff	*Ákos PILGERMÁJER*

COURSE DESCRIPTION

Concept of numerals, Axioms of Peano, positional numeral systems, arithmetic on positional numeral systems, division, Euclidean algorithm, greatest common divisor (GCD), least common multiple (LCM), extended Euclidean algorithm, number of divisors, prime numbers, irreducible numbers, fundamental theorem of arithmetic, congruencies modulo n, modular arithmetic, congruence or residue classes, complete and reduced residue classes, Euler-Fermat theorem, Euler's totient function, linear congruence systems, Chinese remainder theorem, cryptography, RSA encryption, graph theory elements, search algorithms

SYLLABUS

1. GOALS AND OBJECTIVES

The main goal of this course is to making students capable of building and handling RSA cryptosystems. To this end students must understand basic and specific problems and theorems of number theory and be able to apply them to cryptography.

2. COURSE CONTENT

	TOPICS
LECTURE	1. Elements of Number Theory 2. Elements of Cryptography 3. Elements of Graph Theory
PRACTICE	Not available
LABORATORY PRACTICE	Not available

DETAILED SYLLABUS AND COURSE SCHEDULE

LECTURE(Tuesday: 11:15-12:45 A205)

week	**Topic**	**Compulsory reading**	**Required tasks**	**Completion date, due date**
1.	Introductory example of cryptography	[1] Lesson 1	Student Readiness Test	Next Friday
2.	Remainder division, divisibility	[1] Lesson 2	HW 1	Next Friday

3.	Factorization	[1] Lesson 3	HW 2	Next Friday
4.	Mathematical induction	[1] Lesson 4	HW 3	Next Friday
5.	Conversion	[1] Lesson 5	HW 4	Next Friday
6.	Summary, preparation for midterm1		MTT 1	End of week
7.	Euclidean algorithm	[1] Lesson 6		
8.	Recurring algorithms	[1] Lesson 7	HW 5	Next Friday
9.	Diophantine equations	[1] Lesson 8	HW 6	Next Friday
10.	Congruencies, RSA revisited	[1] Lesson 9	HW 7	Next Friday
11.	Summary, preparation for midterm2		MTT2	End of week
12.	Spring break			
13.	Graph theory elements	[1] Lesson 10		
14.	Search algorithms	[1] Lesson 11		

3. ASSESSMENT AND EVALUATION

ATTENDANCE

Method for monitoring attendance

Attendance sheet/ online test/ other valid means of checking attendance. Making up any absence is not possible according to the current state of science. No need for verification of absence, but keep it under the regulation limit (30 % of total contact hours (usually lectures practice and laboratory classes)).

ASSESSMENT

Course-unit with final examination

Mid-term assessments, performance evaluation and their weighting as a pre-requisite for taking the final exam

Type	**Assessment**	***Weighting as a proportion of the pre-requisite for taking the exam***
1. MidTerm Test 1 (MTT1)	points	40 %
2. MidTerm Test 2 (MTT2)	points	40 %
3. HomeWork (HWs)	points	20 %
4. Attendance	points	+10%

Requirements for the end-of-semester signature

- Attendance prescribed by Code of Studies and Examinations (Art. 45. (2)) - no make ups are possible
- Midterm tests: minimum 40% each - make up for at most one test is possible, see below at retakes
- Homework turned in until deadline (no delays) with non zero points - during availability continuous make ups are possible
- At least 40% of overall performance calculated from the table above.

Re-takes for the end-of-semester signature

In case the student missed at most one MTT or any of the MTTs are unsuccessful, in the first week of exam period she can make it up, or retake it, them once.

Type of examination *(written, oral): written*

The exam is successful if the result is minimum 40%.

Calculation of the final grade

- **Offered grade** (without an exam): in case the mid-term performance is at least 55% (in Neptun student must accept or deny it!),
- **Final grade** (with an exam): in case the student cannot earn the offered grade or does not accept it, then must take an exam. In this case the mid-term performance accounts for ***50***%, the performance at the exam accounts for ***50***% in the calculation of the final grade.

Calculation of the final grade based on aggregate performance in percentage.

Course grade	Performance in %
excellent (5)	85 % …
good (4)	70 % ... 85 %
satisfactory (3)	55 % ... 70 %
pass (2)	40 % ... 55 %
fail (1)	below 40 %

The lower limit given at each grade belongs to that grade.

4. Specified literature

COMPULSORY READING AND AVAILABILITY

[1] lessons in Möbius system and Teams

RECOMMENDED LITERATURE AND AVAILABILITY

[2] Eric Lehman, Frank Thomson Leigthon, Albert R. Meyer, *6.042J / 18.062J Mathematics for Computer Science (Spring 2015)*, Open Courseware MIT , Privacy and Terms of Use

[3] Moodle and Teams course materials