COURSE SYLLABUS AND COURSE REQUIREMENTS
ACADEMIC YEAR 2022/23 SEMESTER SPRING

Course title	*Introduction to Computer Science*
Subject Code	IVB014ANMI
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

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
PRACTICE	Not available
LABORATORY PRACTICE	Not available

DETAILED SYLLABUS AND COURSE SCHEDULE

LECTURE

week	**Topic**	**Compulsory reading**	**Required tasks**	**Completion date, due date**
1.	Introductory example of cryptography	[1] Lesson 1	HW 1	Next Friday
2.	Divisibility	[1] Lesson 2	HW 2	Next Friday
3.	Numeral systems, algorithms	[1] Lesson 3	HW 3	Next Friday

4.	Mathematical induction	[1] Lesson 4	HW 4	Next Friday
5.	Representation of numbers	[1] Lesson 5	HW 5	Next Friday
6.	Euclidean algorithm	[1] Lesson 6	HW 6	End of week
7.	First midterm test (MTT1)		MTT 1	In class
8.	Recurring algorithms	[1] Lesson 7	HW 7	Next Friday
9.	Spring break			
10.	Easter			
11.	Diophantine equations	[1] Lesson 8	HW 8	Next Friday
12.	Congruencies	[1] Lesson 9	HW 9	Next Friday
13.	Holiday (Labour's day)			
14.	Chinese remainder theorem	[1] Lesson 10	HW 10	End of week
15.	Second midterm test MTT2		MTT2	In class

3. ASSESSMENT AND EVALUATION

ATTENDANCE

In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description.

Method for monitoring attendance

In class assessment or attendance sheet

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	Approx. 50 points	40 %
2. MidTerm Test 2	Approx. 50 points	40 %
3. Homeworks	Approx. 100 points	20 %
4. Evaluation of class work	Approx. 50 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 re-takes
- Homeworks turned in until deadline (strictly!) with non zero points - during availability several 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 sudent missed at most one MTT or any of the MTTs are unsuccessful, in the first week of exam period, planned in time of class, 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 grade

- *Offered grade*: in case the mid-term performance is at least 60% (in Neptun student must accept it!),
- *Final grade*: in case the student cannot earn the offered grade or not accept it, then 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

[M] lessons in Möbius system

[LLM] 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

RECOMMENDED LITERATURE AND AVAILABILITY

[ET] Moodle and Teams course materials