COURSE: FUNDAMENTALS OF ALGEBRA		
DEGREE: Applied Mathematics and Computation	**YEAR: 1**	**TERM: 1**

WEEK	SESSION	DESCRIPTION	GROUP		WEEKLY PROGRAMMING FOR STUDENTS		
			LECTURE	SEMINAR	NOTES	LECTURE HOURS	STUDENT WORK
1	1	**1. LOGIC AND PROOFS** 1.1. Propositional logic 1.2. Predicates and Quantifiers	X		Book study, chapters 1.1-1.5 [R]	1.66	6
	2	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	
2	3	1.3. Introduction to proofs	X		Book study, chapters 1.7-1.8 [R] / 1 [L]	1.66	6
	4	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	
3	5	1.4. Induction	X		Book study, chapters 5.1 [R] / 8 [L]	1.66	6
	6	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	
4	7	**2. SETS AND FUNCTIONS** 2.1. Sets and set operations 2.2. Functions	X		Book study, chapters 2.1-2.3 [R] / 1, 17 [L]	1.66	6
	8	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	
5	9	**3. INTEGERS AND MODULAR ARITHMETIC** 3.1. Integers and Divisibility 3.2. Prime numbers. Fundamental Theorem of Arithmetic	X		Book study, chapters 4.1, 4.3 [R] / 10-12 [L]	1.66	6
	10	**MIDTERM 1: Chapters 1 & 2**		X	Review of Chapters 1 & 2. Prepare for the Midterm	1.66	
6	11	3.3. Greatest common divisor	X		Book study, chapters 4.3 [R] / 10-12 [L]	1.66	6
	12	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	
7	13	3.4. **M**odular arithmetic	X		Book study, chapters 4.1 [R] / 13-14 [L]	1.66	6
	14	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	
8	15	3.5. Solving congruences	X		Book study, chapters 4.5 [R] / 13-14 [L]	1.66	6
	15*	3.6. Applications: Criptography			Book study, chapters 4.6 [R] / 15 [L] / 7.1-7.2 [J]		
	16	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	
9	17	**4. GROUPS** 4.1. Permutations	X		Book study, chapters 20 [L] / 5.1-5.2 [J]	1.66	6
	18	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	

10	19	4.2. Groups	X		Book study, chapters 25 [L] / 5.1-5.2 [J]	1.66	6
	20	**MIDTERM 2: Chapter 3**		X	Review of Chapter 3. Prepare for the Midterm	1.66	
11	21	4.3. Los grupos (Z_p^*, x) y (U(Z_m), x)) 4.4. Subgroups	X		Book study, chapters 26 [L] / 3.2-3.3 [J]	1.66	
	22	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	
12	23	4.5. Order and cyclic groups	X		Book study, chapters 26 [L] / 4.1 [J]	1.66	6
	24	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	
13	25	4.6. Lagrange's Theorem 4.7. Euler's and Fermat's Theorems	X		Book study, chapters 26 [L] / 6.1-6.3 [J]	1.66	6
	26	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	
14	27	4.8. Applications: cards shuffles	X			1.66	6
	28	Discussion of selected exercises		X	Odd numbered exercises. Compare with solutions (*)	1.66	
					Subtotal 1	**48**	**84**
					Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	**132**	
15		Tutorial sessions			Prepare for the final exam	3	3
16-18		Assessment			Prepare for the final exam		12
					Total 2 *(Hours of class plus student homework hours between weeks 15-18)*	**3**	**15**
							150

REFERENCES:

- [R] Kenneth H Rosen. Discrete Mathematics and Its Applications. McGraw-Hill Education. 2011 (7ed)
- [L] Martin W. Liebeck. A concise introduction to pure mathematics. CRC Press 2016 (4ed)
- [J] Thomas W. Judson. Abstract Algebra, theory and applications. 2019 Edition http://abstract.pugetsound.edu./index.html

(*) Do some of the recommended exercises of the list corresponding to the previous lecture in large group.