SEMESTER STUDY PLAN DISCRETE MATHEMATICS (COMPULSORY COURSE)



DEPARTMENT OF MATHEMATICS AND DATA SCIENCE FACULTY OF MATHEMATICS AND NATURAL SCIENCES UNIVERSITAS ANDALAS

2024



SEMESTER STUDY PLAN (SSP) BACHELOR PROGRAM OF MATHEMATICS FACULTY OF MATHEMATICS AND NATURAL SCIENCES UNIVERSITAS ANDALAS

Course	Name		Course Coo	de	URL I	-Learn	Credits	Semester	Compilation Date		
Discrete Ma	thematics		MAT6213	81	https://sci.ile	arn.unand.ac.id	4	2	12 May 2024		
			Study	7 Plan	n Creator	Head of Resea	rch Group	Head of	Study Program		
Dorcon In	Charge		Dr. L	Lyra \	Yulianti	Prof. Syafi	rizal Sy	Dr. No	verina Alfiany		
reison in	Charge		Dr. D	Des W	elyyanti		-		-		
			Na	rwen	, M.Si						
	Intende	d Learning (Dutcomes								
Intended Learning	ILO-2	Possesses p	Possesses profound knowledge of the basic concept mathematics								
Outcomes (ILO) and		PI-1: An ability to explain basic mathematical concepts									
Performance		PI-2: An ability to provide examples that are relevant to basic mathematical concepts									
Indicator (PI)		PI-3: An ab	ility to detern	nine s	solutions to simm	ole problems usir	g basic mathe	ematical cond	cepts		
	ILO-3	An ability t	to identify ex	nlain	and generalize s	simple mathemat	ical		1		
	1200	PI-1. An ab	vility to identif	fv sin	nnle mathematic	al problems	icui				
		PI_2: An ah	ility to explain	n eim	nle mathematic	al problems					
		DI 2: An ab	ility to explain		ipie matiematica	tical problems					
		F1-5. All at	inty to genera	alizes	simple matterna	lical problems	_				
	ILO-4	An ability	to use conce	ept ar	nd fundamental	technique of m	athematics in	ı solving sin	nple mathematical		
		problems									
		PI-1: An a	-1: An ability to choose appropriate basic mathematical concepts and techniques in solving simple								
		math	mathematical problems								
		PI-2: An a	bility to illus	strate	e simple mathen	natical problems	based on ap	opropriate b	asic mathematical		
		conce	pts and techn	niques	S						

	PI-3: An ability to solve simple mathematical problems using appropriate basic mathematical concepts and
	techniques
ILO-5	An ability to formally and correctly proves a simple mathematical statement using facts and methods that
	have been studied.
	PI-1: An ability to identify formal structures and analogous forms in mathematics
	PI-2: An ability to use facts and apply methods to prove simple mathematical statements
	PI-3: An ability to present simple mathematical statement proof rigorously (sequentially and
	conscientious)
	PI-4: An ability to conclude or interpret result of the proving simple mathematical statement
ILO-6	Have ability data literacy and technology and can apply them in solving simple mathematical problems or
	other relevant fields
	PI-1: An ability to identify the right data and technology to solve simple mathematical problems or other
	fields
	PI-2: An ability to use data and technology and apply them to solve simple mathematical statements or
	other areas
	PI-3: An ability to process data using available technology in simple mathematical problems or other fields
	PI-4: An ability to conclude and interpret data processing results for simple mathematical problems or other
	fields
	PI-5: An ability to design an algorithm to solve simple mathematical problems or other fields
Course I	Learning Outcomes
1	Have a strong understanding of logic and how to prove some statements
2	Mastering the basic principles of mathematical induction as well as several proof techniques, and being able
2	to apply them to relevant cases.
2	Understand and apply the basic principles of counting, pigeonhole principle, permutations and
3	combinations, binomial coefficients, and discrete probability in relevant cases
1	Understand and apply the concept of recurrent relations, generating functions, the principle of inclusion-
4	exclusion and the concept of equivalent relations in relevant cases.

Brief Description	This course gives a basic understand	ing of mathematics, including mathematics induction principle, recursive									
	relation, basic principles of counting,	pigeonhole principle, permutations and combinations, binomial coefficients,									
	discrete probabilities, recurrence relati	ons, inclusion-exclusion principle, and relation. This course is implemented									
	using the PjBL learning method which	allows students to apply the material they have obtained in lectures to daily									
	problems.										
Course Materials	1. Logic and Proof										
	2. Principles of Mathematical Induct	tion									
	3. Basic principles of counting										
	4. Discrete Probability										
	5. Advanced Counting Techniques	5. Advanced Counting Techniques									
	6. Recurrent relations										
	7. Generating Function and Inclusio	n-Exclusion principle									
	8. Relation										
References	Main:										
	1. K.H. Rosen, Discrete Mathematics a	1. K.H. Rosen, Discrete Mathematics and Applications, McGraw-Hill, New York, 7th Edition, 2012									
	Additional:										
	V. Bryant, Aspect of Combinatorics: A W	<i>ide-ranging introduction</i> , Cambridge Univ. Press, Great Britain, 1995.									
	P-2 Erickson, M. Pearls of Discrete Math	ematics, CRC Press, Taylor, and Francis Group, 2010									
Learning Media	Software:	Hardware:									
	• LMS Unand	• Computer/Laptop									
	(http://fmipa.ilearn.unand.ac.id/)										
		• Smartphone									
	• Zoom meeting										
	• Whatsapp										
Team Teaching	1. Dr. Lyra Yulianti										
	2. Dr. Des Welyyanti										
	3. Narwen, M.Si										
Assessment	Homework, Quizzes, Mid-Term exa	m, Final exam									

Required courses	MAT61111 Introduction to Mathematics
Academic Norms	<u>https://akademik.unand.ac.id/images/2022-03-</u> <u>30%20Peraturan%20Rektor%20Nomor%207%20Tahun%202022%20Penyelenggaraan%20Pendidikan-</u> <u>khusus%20Bab%20II.pdf</u>

Weekly Study Plan

		Indicator	or Assessment (4)		Activities/Forms [Time estim	of Learning nated]				
Week/	Course Outcomes			Synchronous*		Asynchronous**			Subject references	Weight
(1) 1/1	(2)	(3)		Face to face Offline (5)	Face to face Online (6)	Individual (7)	Collaboration (8)	Media (9)	(10)	(11)
1/1	CLO-1 Have a strong understanding of logic and how to prove some statements (ILO-2: PI-1, PI-2, PI-3)	 Discipline in carrying out course contracts Accurate understan ding of related material 	Activeness in lectures	 Teaching and discussion: Introduction to SSP material explanation task explanation discussion and question-and- answer lecture material brief explanation of the final project [1 x 2 x 50 minute] 		Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	• PPT • i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video	 Assessment Rules, SSP, Syllabus, Tuition Contract Review of Logic and Proof Strategies 	

1/2	CLO-1 Have a strong understanding of logic and how to prove some statements (ILO-2: PI-1, PI-2, PI-3)	Accurate understandin g of related material	Activeness in lectures	Teaching and discussion: - material explanation [1 x 2 x 50 minute]	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	• PPT • i-learn (LMS Unand) • Specific condition: Zoom meeting, WA group, learning video	Some proof techniques, i.e <i>working backward,</i> <i>counter examples,</i> and adaptation of existing proofs.	
2/3	CLO-2 Mastering the basic principles of mathematical induction as well as several proof techniques, and being able to apply them to relevant cases (ILO-3: PI-1, PI-2, PI-3)	Accurate understandi ng of related material	Activeness in lectures	Teaching and discussion: - material explanation [1 x 2 x 50 minute]	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	 PPT i-learn (LMS Unand) Specific condition: Zoon meeting, WA group, learning video 	Principle of Mathematics Induction, Principle of Recursive Function, review of function and sets	
2/4	CLO-2 Mastering the basic principles of mathematical induction as well as several proof techniques, and being able to apply them to	Accurate understandin g of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	 PPT i-learn (LMS Unand) Specific condition: Zoon meeting, WA group, learning 	Principle of Induction Mathematics and recursive relation, Fibonacci number and Lucas number	

	relevant cases						video		
	(ILO-3: PI-1, PI-2,								
	PI-3)								
3/5	CLO-3	Accurate	Activeness	Teaching and	Students read	Students	∎РРТ	Basic rules in	
	Understand and	understandin	in lectures	discussion:	and study the	discuss in		counting theory:	
	apply the basic	g of related		material	learning	groups about	•i-learn (LMS	sum rules and	
	principles of	material		explanation [1 x 2 x	materials	lecture	Unand) Specific	product rules,	
	counting,			50 minute]	individually	material	condition: Zoom	inclusion-	
	pigeonhole				[1 x 2 x 60		meeting, WA	exclusion	
	principle,				minutes]		group, learning	principle,	
	permutations and					[1 x 2 x 60	video	pigeonhole	
	combinations,					minutes]		principle	
	binomial								
	coefficients, and								
	discrete								
	probability in								
	relevant cases								
3/6	CLO-3	Accurate	Activeness	Teaching and	Students read	Students	• PPT	Applications of	
	Understand and	understandin	in lectures	discussion:	and study the	discuss in		Inclusion-	
	apply the basic	g of related		material	learning	groups about	• 1-learn (LIVIS	exclusion	
	principles of	material		explanation $[1 \times 2 \times 10^{-5}]$	materials	lecture	Unand) Specific	principle and	
	counting,			50 minute]	individually	material [1 x 2	condition: Zoom	pigeonhole	
	pigeonhole				$[1 \times 2 \times 60]$	x 60 minutes]	meeting, wA	principle	
	principle,				minutes]		group, learning		
	permutations and						viueo		
	combinations,								
	binomial								
	discrete								
	probability in								
	rolovant cases								
4/7	CLO-3	Accurate	Activeness	Teaching and	Students read	Students		Basic concents in	
т/ /	Understand and	understandin	in lectures	discussion.	and study the	discuss in	• PPT	permutation and	
	apply the basic	g of related	in rectared	material	learning	groups about	• i-learn (LMS	combination	
	principles of	material		explanation $\begin{bmatrix} 1 \\ x \end{bmatrix} 2 x$	materials	lecture	Unand)		
					in dividually	matorial	Specific		

	pigeonhole principle, permutations and combinations, binomial coefficients, and discrete probability in relevant cases				[1 x 2 x 60 minutes]	[1 x 2 x 60 minutes]	condition: Zoom meeting, WA group, learning video)		
4/8	CLO-3 Understand and apply the basic principles of counting, pigeonhole principle, permutations and combinations, binomial coefficients, and discrete probability in relevant cases	Accurate understandin g of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	• PPT • i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video)	Some examples in solving problems using permutation and combination	
5/9	CLO-3 Understand and apply the basic principles of counting, pigeonhole principle, permutations and combinations, binomial coefficients, and discrete probability in	Accurate understandin g of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	• PPT • i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video)	Binomial theorem and combinatorial proof of the theorem	

	relevant cases								
5/10	CLO-3 Understand and apply the basic principles of counting, pigeonhole principle, permutations and combinations, binomial coefficients, and discrete probability in relevant cases	Accurate understandin g of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	 PPT i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video) 	Properties of binomial coefficients	
6/11	CLO-3 Understand and apply the basic principles of counting, pigeonhole principle, permutations and combinations, binomial coefficients, and discrete probability in relevant cases	Accurate understandin g of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	 PPT i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video) 	Generalized permutation and combination	
6/12	CLO-3 Understand and apply the basic principles of counting, pigeonhole	Accurate understandin g of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]	Students read and study the learning materials individually [1 x 2 x 60	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	 PPT i-learn (LMS Unand) Specific condition: Zoom 	The applications of generalized permutation and combination in counting problems	

	principle,				minutes]		meeting, WA		
	permutations and						group, learning		
	combinations,						video)		
	binomial								
	coefficients, and								
	discrete								
	probability in								
	relevant cases								
7/13	CLO-3 Understand and apply the basic principles of counting, pigeonhole principle, permutations and combinations, binomial coefficients, and discrete probability in relevant cases	 Accurate understan ding of related material Accuracy in answering assignmen t questions Neatness of task execution 	Task 1	Teaching and discussion: explanation of learning material explanation of the task explanation of the assessment [1 x 2 x 50 minutes]	 Students read and study learning materials Students do assignments independent ly 	Students discuss in groups about lecture material and assignment [1 x 2 x 60 minutes]	 PPT i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video) 	Random variables and Bayes theorem	10 %
		 Originality of task 							
7/14	CLO-3 Understand and apply the basic principles of counting, pigeonhole principle, permutations and combinations, binomial	 Accurate understan ding of related material Accuracy in answering assignmen t questions 	Quiz 1	Teaching and discussion: explanation of learning material explanation of the task explanation of the assessment [1 x 3 x 50 minutes]	 Students read and study learning materials Students do assignments independent1 y 		 PPT i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video) 	Nilai harapan dan variansi	10 %

	discrete probability in relevant cases	 Neatness of task execution Originality of task 								
8 and 9					MID-TERM	EXAM				
10/15	CLO-4: Understand and apply the concept of recurrent relations, generating functions, the principle of inclusion- exclusion and the concept of equivalent relations in	Accurate understanding of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]	n	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	 PPT i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video) 	Counting problems that cannot be solved using ordinary counting techniques	
10/16	CLO-4: Understand and apply the concept of recurrent relations, generating functions, the principle of inclusion- exclusion and the concept of equivalent relations in relevant cases	Accurate understanding of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]	n	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	 PPT i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video) 	Recurrence relation, generating function that can be modeled as recurrence relation	

11/17	CLO-4:	Accurate	Activeness	Teaching and	Students read and	Students	• DDT	Generating	
	Understand and	understanding	in lectures	discussion:	study the learning	discuss in	•rr i	function to solve	
	apply the concept	of related		explanation	materials	groups about	•i-learn (LMS	counting	
	of recurrent	material		of learning	individually	lecture	Unand)	problems	
	relations,			material	[1 x 2 x 60	material [1 x 2	Specific	1	
	generating			[1 x 3 x 50	minutes	x 60 minutes]	• Specific		
	functions, the			minutesl			Zoom		
	principle of]			Zoom mosting WA		
	inclusion-			(Specific			meeting, WA		
	exclusion and the			conditions:			group,		
	concept of			The total			rearning		
	equivalent			number of			videoj		
	relations in			blended					
	relevant cases			learning					
				meetings is 40					
				% of the total					
				number of					
				meetings)					
11/18	CLO-4:	Accurate	Activeness	Teaching and	Students read and	Students		Generating	
11/10	Understand and	understanding	in lectures	discussion.	study the learning	discuss in	• PPT	function to	
	apply the concept	of related		explanation	materials	groups about	•i-learn (LMS	solve	
	of recurrent	material		of learning	individually	lecture	Unand)	recurrence	
	relations.	inaterial		material	$[1 \times 2 \times 60]$	material [1 x 2	,	relation	
	generating			$\begin{bmatrix} 1 \\ x \\ 3 \\ x \\ 50 \end{bmatrix}$	minutes	x 60 minutes	Specific	counting	
	functions, the			minutesl	minuteoj	x oo minateo]	condition:	problems	
	principle of			minuteoj			Zoom meeting,	problems	
	inclusion-			(Specific			WA group,		
	exclusion and the			conditions.			learning video)		
	concept of			The total			0 /		
	equivalent			number of					
	relations in			blended					
	relevant cases			learning					
	Lete Fully Cubeb			meetings is 40					
				% of the total					
				number of					
				meetings)					
				meetings)					

12/19	CLO-4:	Accurate	Activeness	Teaching and	Students read and	Students	DDT	Generalizations	
,	Understand and	understanding	in lectures	discussion:	study the learning	discuss in	• FF I	of inclusion-	
	apply the concept	of related		explanation	materials	groups about	●i-learn (LMS	exclusion	
	of recurrent	material		of learning	individually	lecture	Unand)	principle	
	relations,			material	$[1 \times 2 \times 60]$	material [1 x 2		1 1	
	generating				minutes	x 60 minutes]	Specific		
	functions, the			[1 x 3 x 50	L	1	condition:		
	principle of			minutesl			Zoom meeting,		
	inclusion-]			WA group,		
	exclusion and the			(Specific			learning video)		
	concept of			conditions:					
	equivalent			The total					
	relations in			number of					
	relevant cases			blended					
				learning					
				meetings is 40					
				% of the total					
				number of					
				meetings)					
12/20	CLO-4:	Accurate	Activeness	Teaching and	Students read and	Students	DDT	Some examples	
	Understand and	understanding	in lectures	discussion:	study the learning	discuss in	•rr i	of generalized	
	apply the concept	of related		explanation	materials	groups about	•i-learn (LMS	inclusion-	
	of recurrent	material		of learning	individually	lecture	Unand)	exclusion	
	relations,			material	[1 x 2 x 60	material [1 x 2	Specific	principle	
	generating			[1 x 3 x 50	minutes]	x 60 minutes]	condition:		
	functions, the			minutes]			Zoom meeting,		
	principle of						WA group,		
	inclusion-			(Specific			learning video)		
	exclusion and the			conditions:					
	concept of			The total					
	equivalent			number of					
	relations in			blended					
	relevant cases			learning					
				meetings is 40					
				% of the total					
				number of					

					meetings)					
13/21	CLO-4: Understand and apply the concept of recurrent relations, generating functions, the principle of inclusion- exclusion and the concept of equivalent relations in relevant cases	Accurate understanding of related material	Activeness in lectures		Teaching and discussion: explanation of learning material [1 x 3 x 50 minutes] (Specific conditions: The total number of blended learning meetings is 40 % of the total number of meetings)	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	• PPT • i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video)	Some examples of applications of generalized inclusion- exclusion principle	
13/22	CLO-4: Understand and apply the concept of recurrent relations, generating functions, the principle of inclusion- exclusion and the concept of equivalent relations in relevant cases	Accurate understanding of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]		Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	• PPT • i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video)	Some examples of applications of generalized inclusion- exclusion principle	
14/23	CLO-4: Understand and apply the concept	Accurate understanding of related	Activeness in lectures	Teaching and discussion: material explanation		Students read and study the learning	Students discuss in groups about	●PPT ●i-learn (LMS	Definitions, concepts, and properties of	

	of recurrent relations, generating functions, the principle of inclusion- exclusion and the concept of equivalent relations in relevant cases	material		[1 x 2 x 50 minute]	materials individually [1 x 2 x 60 minutes]	lecture material [1 x 2 x 60 minutes]	Unand) Specific condition: Zoom meeting, WA group, learning video)	relation and biner relation	
14/24	CLO-4: Understand and apply the concept of recurrent relations, generating functions, the principle of inclusion- exclusion and the concept of equivalent relations in relevant cases	Accurate understanding of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	 PPT i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video) 	Relation representation, equivalent relation, equivalent classes, and partition	
15/25	CLO-4: Understand and apply the concept of recurrent relations, generating functions, the principle of inclusion- exclusion and the concept of	Accurate understanding of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]	Students read and study the learning materials individually [1 x 2 x 60 minutes]	Students discuss in groups about lecture material [1 x 2 x 60 minutes]	 PPT i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video) 	Ordered partition, partial ordering, lexicographic ordering	

15/26	equivalent relations in relevant cases CLO-4: Understand and apply the concept of recurrent relations,	Accurate understanding of related material	Activeness in lectures	Teaching and discussion: material explanation [1 x 2 x 50 minute]	Students read and study the learning materials individually [1 x 2 x 60	Students discuss in groups about lecture material [1 x 2	• PPT • i-learn (LMS Unand) Specific	Hasse Diagram, maximal and minimal elements	
	generating functions, the principle of inclusion- exclusion and the concept of equivalent relations in relevant cases				minutes]	x 60 minutes]	condition: Zoom meeting, WA group, learning video)		
16/27	CLO-4: Understand and apply the concept of recurrent relations, generating functions, the principle of inclusion- exclusion and the concept of equivalent relations in relevant cases	 Accurate understandi ng of related material Accuracy in answering assignment questions Neatness of task execution Originality of task 	Task 2	Teaching and discussion: explanation of learning material explanation of the task explanation of the assessment [1 x 2 x 50 minutes]	 Students read and study learning materials Students do assignments independently [1 x 2 x 60 minutes] 	Students discuss in groups about lecture material and assignment [1 x 2 x 60 minutes]	 PPT i-learn (LMS Unand) Specific condition: Zoom meeting, WA group, learning video) 	Review materials	10 %
16/28	CLO-4: Understand and apply the concept of recurrent relations,	• Accurate understandi ng of related material	Quiz 2	Teaching and discussion: explanation of learning material	 Students read and study learning materials Students do 	Students discuss in groups about lecture	• PPT • I-learn (LMS Unand)	Review materials	10 %

	generating functions, the principle of inclusion- exclusion and the concept of equivalent relations in relevant cases	 Accuracy in answering assignment questions Neatness of task execution Originality of task 	explanation of the task explanation of the assessment [1 x 3 x 50 minutes]		assignments independently [1 x 2 x 60 minutes]	material and assignment [1 x 2 x 60 minutes]	• Specific condition: Zoom meeting, WA group, learning video)	
17 s/d 18			FINA	L EXAMINAT	ION			30 %

1 credit = 50 minutes face-to-face meeting, 60 minutes structured study, 60 minutes independent study Each meeting duration is 2 credits = 2×50 minutes

Indicators, Criteria, and Assessment Weights

1.	Assessment weight for e	each Asses	sment

NO	Assessment	Weight (%)
1	Mid-Term Exam	30
2	Final Exam	30
3	Homework	20
4	Quiz	20
	TOTAL	100

2. Assessment weight for Intended Learning Outcome

- a) CLO-1: 15 %
- b) CLO-2. 15 %
- c) CLO-3: 20 %
- d) CLO-4: 50 %

Assessment Plan Table:

CLO	Ta	ısk	Qu	ıiz	Mid-term	Final	τοτλι
	1	2	1	2	Exam	Exam	IOIAL
Have a strong understanding of logic and how to prove some statements	2.5 %		2.5 %		10 %		15 %
Mastering the basic principles of mathematical induction as well as several proof techniques, and being able to apply them to relevant cases.	2.5 %		2.5 %		10 %		15 %
Understand and apply the basic principles of counting, pigeonhole principle, permutations and combinations, binomial coefficients, and discrete probability in	5 %		5 %		10 %		20 %

relevant cases							
Understand and apply the concept of recurrent relations, generating functions, the principle of inclusion-exclusion and the concept of equivalent relations in relevant cases		10 %		10 %		30 %	50%
TOTAL	20	%	20	%	30%	30%	100%

Matrix of CLO and ILO

																IL	O															
		1			2			3			4			5	5				6				7			8	3			Ç)	
CLO		PI			PI			PI			PI			P	ľ				PI				PI			F	PI			P	PI	
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	4	1	2	3	4	5	1	2	3	1	2	3	4	1	2	3	4
1										✓	\checkmark	\checkmark																				
2										~	✓	\checkmark																				
3																	\checkmark	✓	~	✓	✓											
4																	✓	~	\checkmark	✓	✓											

5																						\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	✓				
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