


COURSE LEARNING PLAN

	UNIVERSITY OF BRAWIJAYA FACULTY OF ANIMAL SCIENCE DEPARTMENT OF ANIMAL SCIENCE UNDERGRADUATE STUDY PROGRAM OF ANIMAL SCIENCE LEARNING PLAN			
Course	Code	Weight (credits)	Semester	Compilation Date
Animal Breeding	PEP 4009	3 (2-1)	4	July 25, 2020
Authorization	Supervising Lecture		Head of Undergraduate Study Program of Animal Science	Vice Dean 1
	Prof.Dr.Ir.Luqman Hakim,MS. Prof. Dr.Ir.Sucik Maylinda,MS. Prof.Dr.Ir.V.M.Ani Nurgiartiningsih,MSc. Prof.Dr.Ir.Gatot Ciptadi,DESS. IPU, ASEAN Eng. Dr.Ir.Agus Budiarto,MS. Dr Ahmad Furqon, SPt.		Dr. Herly Evanuarini, S.Pt., MP.	Dr. Halim Natsir, S.Pt., MP., IPM., ASEAN Eng.
Learning Outcome (LO)	PLO			
	1. LO4: Able to develop comprehensive insight and mindset according to the science and field of the animal industry 2. LO6: Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science 3. LO10: Able to involve themselves in the learning process and discussion on an ongoing basis 4. LO12: Able to design and conduct experiments, analyze and interpret data to make correct decisions in solving problems in the field of animal science, meet ethics, and have environmental insight			
	CLO			
1. Able to explain the basic principles of livestock breeding including genetic parameters, selection, genetic progress and regulation of the breeding system				

	2. Able to calculate and analyze livestock genetic potential, genetic parameters, and genetic progress due to selection 3. Able to learn and develop self-learn insights in evaluating the implementation of livestock breeding programs in Indonesia	
Brief Course Description	This course encompasses understanding the concept of livestock breeding, qualitative and quantitative traits, estimated genetic parameters (heritability = h^2 , repeatability = r , genetic correlation = r_G), estimation of Breeding Value (BV), Most Probable Producing Ability (MPPA), Estimated Real Producing Ability (ERPA), the estimation of the selection response, the correlated response, the method of selecting one trait and more than one trait, and the mating/breeding system	
Sub-Course/Subject	1. INTRODUCTION 2. Estimation of genetic parameters (heritability, repeatability, genetic correlation) 3. BV, MPPA and ERPA estimates 4. Selection response estimates and correlated responses 5. The method of selecting one trait and more than one trait 6. Mating system	
References	Falconer, DS. Introduction to Quantitative Genetics. 1989. Longman Scientific & Technical. New York. Ciptadi, G. A. Budiarto, Aulani'am, Y Oktanella. 2019. Genetika dan Pemuliaan: Peternakan-Veteriner. UB Press. Malang. ISBN 978-602-432-950-1 Hakim, L. 2011. Dasar Pemuliaan Ternak. Darkah Media Malang. ISBN: 978-602-96331-5-3 Hardjosubroto, W. 1994. Aplikasi Pemuliabiakan Ternak di Lapangan. PT Gramedia Widiasarana Indonesia. Jakarta. Lasley, J.F. 1978. Genetics of Livestock Improvement. 3 rd ed. Prentice-Hall of India, Private Ltd, New Delhi. Maylinda, S. 2010. Buku Pengantar Pemuliaan Ternak. UB Press. Malang Nurgiartiningsih, V. M. A. 2017. Pengantar Parameter Genetik pada Ternak. UB Press, Malang. ISBN:978-602-432-331-8 Udo, H. 1992. Ruminant Breeding Strategies for the Tropics. Wageningen Agricultural University. The Netherlands. Warwick, E. J., M. Astuti, and W. Hardjosubroto. 1990. Pernuliaan Ternak. Gadjah Mada University Press. Yogyakarta.	
Learning Media	Software	Hardware
	Zoom, Google Classroom and WA Group	Smartphone, LCD and Laptop
Teaching Team	Prof. Dr. Ir. Luqman Hakim,MS. Prof. Dr. Ir. Sucik Maylinda,MS. Prof. Dr. Ir. V.M. Ani Nurgiartiningsih,MSc. Prof. Dr.Ir.Gatot Ciptadi,DESS. IPU, ASEAN Eng. Dr. Ir. Agus Budiarto,MS.	

		Dr. Ahmad Furqon, SPt.				
Prerequisite Courses		Genetics, Statistics				
Week	Sub-Course learning Outcome	Indicator	Learning Material/Topic	Learning Method	Criteria & Form of Assessment	Weight of assessment
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	<p>Understanding the contents of the Learning Plan</p> <p>Describing the principles of livestock breeding, qualitative and quantitative traits.</p>	<p>Able to explain the relevance and purpose of livestock breeding</p> <p>Able to explain the principles of livestock breeding, qualitative and quantitative characteristics/traits and basic population statistics (mean, SD, variety).</p>	<p>Lecture contract, description of the scope of qualitative and quantitative traits in livestock breeding:</p> <p>Definition, relevance and purpose of Animal Breeding</p> <p>Definition of qualitative and quantitative properties</p>	<p>1. Lecture</p> <p>2. Discussion</p>	<p>Criteria:</p> <p>Able to explain the principles of livestock breeding logically</p> <p>Able to distinguish and provide examples of quantitative and qualitative traits in livestock</p> <p>Assessment form:</p> <p>Midterm-test</p>	
2	<p>Explaining the meaning and the importance of heritability to improve the genetic quality of livestock</p> <p>Calculating the heritability value using several estimation methods</p>	<p>Able to explain the meaning and importance of heritability in improving the genetic quality of livestock and able to</p>	<p>Estimating genetic parameters (I):</p> <p>Heritability value estimation method</p> <p>Application of heritability values in livestock breeding</p>	<p>1. Lecture</p> <p>2. Discussion</p> <p>3. Exercise</p>	<p>Criteria:</p> <p>Able to explain the concept of heritability values logically and systematically</p>	

		predict heritability values			<p>Able to calculate heritability values correctly</p> <p>Assessment Form: Individual assignments and Midterm-test</p>	
3	<p>Explaining the meaning and the importance of repeatability to improve the genetic quality of livestock</p> <p>Calculating the repeatability value using several estimation methods</p>	<p>Able to explain the meaning and importance of repeatability in improving the genetic quality of livestock and be able to estimate the value of repeatability</p>	<p>Estimating genetic parameters (II):</p> <p>The method of estimating the value of repeatability</p> <p>Application of repeatability value in livestock breeding</p>	<p>1. Lecture</p> <p>2. Discussion</p>	<p>Criteria:</p> <p>Able to explain the concept of repeatability value logically and systematically</p> <p>Able to calculate the repeatability value correctly</p> <p>Assessment Form: Individual assignments and Midterm-test</p>	

4	<p>Explaining the meaning and the importance of genetic correlation to improve the genetic quality of livestock</p> <p>Calculating the value of genetic correlation using several estimation methods</p>	<p>Able to explain the meaning and importance of genetic correlation in improving the genetic quality of livestock and able to estimate the value of genetic correlation values for economic traits</p>	<p>Estimating genetic parameters (III):</p> <p>Method of estimating the value of genetic correlation</p> <p>Benefits and application of genetic correlation values in livestock breeding (e.g. <i>zuriat</i> test on livestock)</p>	<p>1. Lecture</p> <p>2. Discussion</p>	<p>Criteria:</p> <p>Able to explain the concept of genetic correlation logically and systematically</p> <p>Be able to calculate the value of genetic correlation correctly</p> <p>Assessment Form:</p> <p>Individual assignments and UTS</p>	
5	<p>Explaining the meaning and the importance of BV to improve the genetic quality of livestock</p> <p>Calculating BV</p>	<p>Able to predict BV and interpret it in the livestock selection program</p>	<p><i>BV</i> estimation</p>	<p>1. Lecture</p> <p>2. Discussion</p> <p>3. Individual structured assignment</p>	<p>Criteria:</p> <p>Able to explain the BV concept logically and systematically</p> <p>Able to calculate BV correctly</p>	


					Assessment form: Written test and Midterm-test	
6 and 7	<p>Understanding the meaning and importance of MPPA and ERPA to improve the genetic quality of livestock</p> <p>Having the ability to calculate the MPPA and ERPA values</p> <p>Understanding the application of MPPA and ERPA values in livestock selection programs</p>	<p>Able to estimate MPPA and ERPA values and interpreting them in the livestock selection program</p>	<i>MPPA and ERPA</i> estimation	<p>1. Lecture</p> <p>2. Discussion</p> <p>3. Quiz</p> <p>4. Group assignments</p>	<p>Criteria: Able to explain the MPPA and ERPA concepts logically and systematically Able to correctly calculate MPPA and ERPA</p> <p>Assessment form: Written test (quiz) and Midterm-test</p>	
8	<p>Explaining the meaning and importance of the selection response, selection differential, selection intensity, selection proportion and generation interval</p> <p>Calculating the selection response per generation and per year</p>	<p>Able to describe all parameters in estimating the selection response</p> <p>Able to calculate the selection response per generation and per year</p>	<p>Estimating Selection Response:</p> <p>Definition of selection response, selection differential, selection intensity, selection proportion and generation interval</p>	<p>1. Lecture</p> <p>2. Discussion</p>	<p>Criteria: Able to describe the estimated selection response logically and systematically Able to calculate the selection</p>	

			Estimating selection response per generation and per year		response correctly Assessment form: Individual assignments and Final Exam	
9	Describing the meaning and application of correlated responses Calculating correlated responses	Able to explain and calculate/measure correlated response	Estimating correlated response: Understanding correlated response Estimating correlated response due to selection	1. Lecture 2. Discussion 3. Exercise	Criteria: Able to explain logically and systematically correlated responses Assessment form: Written test and Final Exam	
10	Explaining the various methods of selecting a single trait	Able to explain the type of selection of one trait and determine the most appropriate in livestock breeding	Single trait selection method: Individual selection, progeny test, family selection, pedigree selection	1. Lecture 2. Discussion 3. Individual structured assignment	Criteria: Able to explain the method of selecting one trait logically and systematically Assessment form: Quiz and Final Exam	

11	Explaining the various methods of selecting more than a trait	Able to explain the type of selection for more than a trait and determining the most appropriate for livestock breeding	More than a trait selection method: Selecting two or more traits: tandem selection, independent culling level, index selection	1. Lecture 2. Discussion	Criteria: Able to explain the method of selecting more than one trait logically and systematically Assessment form: Final Exam	
12 and 13	Explaining the meaning and effects of genetic and phenotypic inbreeding Calculating inbreeding size, inbreeding and inbreeding depression	Able to explain the concept of inbreeding and the effects and predict inbreeding pressure	The related mating individual system: Understanding inbreeding mating and inbreeding individuals Inbreeding measures and inbreeding mating Genetic and phenotypic effects due to inbreeding Estimation of inbreeding pressure	1. Lecture 2. Discussion 3. Individual structured assignment	Criteria: Able to explain the inbreeding system logically and systematically Able to convey arguments within and between groups properly and effectively Able to calculate inbreeding pressure Assessment form: Group structured assignments	

					(papers / presentations) and Final Exam	
14	<p>Explaining the meaning, objective and effects of non-consanguineous/non-related mating</p> <p>Measuring the heterosis effect</p> <p>Describing the affecting factor of heterosis</p>	<p>Able to explain the concept of non-consanguineous /non-related/outbreeding mating</p> <p>Able to explain the influencing factors of the heterosis effect and calculating the heterosis effect</p>	<p>Individual non-consanguineous mating system: Types of outbreeding and the benefits</p> <p>Genetic and phenotypic effects due to outbreeding</p> <p>Estimation of the effects of heterosis and influencing factors</p>	<p>1. Lecture</p> <p>2. Discussion</p> <p>3. Quiz</p>	<p>Criteria:</p> <p>Able to explain the non-consanguineous mating system logically and systematically</p> <p>Assessment form:</p> <p>Written test and Final Exam</p>	

ASESEMENT RUBRIC

	UNIVERSITY OF BRAWIJAYA FACULTY OF ANIMAL SCIENCE DEPARTMENT OF ANIMAL SCIENCE UNDERGRADUATE STUDY PROGRAM OF ANIMAL SCIENCE		
Course	Animal Breeding		
Score Level	CLO and PLO	Conversion	PLO score
PLO 6: Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science PLO 10: Able to involve themselves in the learning process and discussion on an ongoing basis CLO 1: Able to explain the basic principles of livestock breeding including genetic parameters, selection, genetic progress and regulation of the mating system			
Very Good (4)	Showing a very good understanding of the concepts related to the basic principles of livestock breeding including genetic parameters, selection, genetic progress and the regulation of the mating system	>80-100	0.5
Good (3)	Showing a good understanding of the concepts related to the basic principles of livestock breeding including genetic parameters, selection, genetic progress and the regulation of the mating system	>70-80	0.375
Moderate (2)	Showing a moderate understanding of the concepts related to the basic principles of livestock breeding including genetic parameters, selection, genetic progress and the regulation of the mating system	>60-70	0.25
Poor (1)	Showing a poor understanding of the concepts related to the basic principles of livestock breeding including genetic parameters, selection, genetic progress and the regulation of the mating system	<60	0.125
Score Level	CLO and PLO	Conversion	PLO score
PLO 12: Able to design and conduct experiments, analyze and interpret data to make correct decisions in solving problems in the field of animal science, meet ethics, and have environmental insight			

PLO 10: Able to involve themselves in the learning process and discussion on an ongoing basis CLO 2: Able to calculate and analyze livestock genetic potential, genetic parameters, and genetic progress due to selection			
Very Good (4)	Showing very good abilities in counting and analyzing the genetic potential of livestock, genetic parameters and genetic progress due to selection	>80-100	0.5
Good (3)	Showing good abilities in counting and analyzing the genetic potential of livestock, genetic parameters and genetic progress due to selection	>70-80	0.375
Moderate (2)	Showing moderate abilities in counting and analyzing the genetic potential of livestock, genetic parameters and genetic progress due to selection	>60-70	0.25
Poor (1)	Showing poor abilities in counting and analyzing the genetic potential of livestock, genetic parameters and genetic progress due to selection	<60	0.125
Score Level	CLO and PLO	Conversion	PLO score
PLO 4: Able to develop comprehensive insight and mindset according to the science and field of the animal industry PLO 10: Able to involve themselves in the learning process and discussion on an ongoing basis CLO 3: Able to learn and develop self-learn insights in evaluating the implementation of livestock breeding programs in Indonesia			
Very Good (4)	Showing a very good scientific insight related to evaluating the implementation of livestock breeding programs in Indonesia	>80-100	0.5
Good (3)	Showing a good scientific insight related to evaluating the implementation of livestock breeding programs in Indonesia	>70-80	0.375
Moderate (2)	Showing a moderate scientific insight related to evaluating the implementation of livestock breeding programs in Indonesia	>60-70	0.25
Poor (1)	Showing a poor scientific insight related to evaluating the implementation of livestock breeding programs in Indonesia	<60	0.125

$$\text{Counting PLO Score: } \frac{\text{Level Skor}}{\sum \text{level skor}} \times \frac{\sum \text{CLO}}{\sum \text{PLO}}$$

Calculation of Courses Learning Outcome (CLO) Score

Assessed Components	Component Weight	CLO Weight		
		CLO 1	CLO 2	CLO 3
Midterm Exam	0.3	0.5	0.5	
Final Exam	0.3	0.5	0.5	
Practicum	0.2	0.4	0.4	0.2
Group assignment	0.1	0.25	0.25	0.5
Individual structured assignment and Quiz	0.1	0.25	0.25	0.5
CLO Weight				

The orange color must be fulfilled by lecturer team

Steps to fulfill:

1. Assessment components = the components that will be assessed in one course (for example Midterm Exam, Final Exam, percentage, quiz, etc.)
2. Component weight = Determine the weight of each component where the total of all components is 1
3. CLO weight on the Score
 - a. Show the number of CLO in each course (for example, the Forage Industry course has 4 CLOs).
 - b. Determine the components of the assessment aimed at achieving any number of CLO
 - c. The total weight of the CLO score for each component is 1

PLO Score Calculation

CLO	CLO Score	CLO Weight	PLO			
			PLO 4	PLO 6	PLO 10	PLO 12


CLO 1				0.5	0.5	
CLO 2					0.5	0.5
CLO 3			0.5		0.5	

The orange color must be fulfilled by lecturer team

Step to fulfill:

1. CLO = write the number of CLO in each course (refer to the previous table)
2. PLO = write the number of PLO in each course based on the RPS
3. PLO weight
 - a. Show the number of PLO in each course (for example, the Forage Industry course has 3 PLOs).
 - b. Determine the components of the assessment aimed at achieving any number of PLO
 - c. The total weight of the PLO score for each component is 1

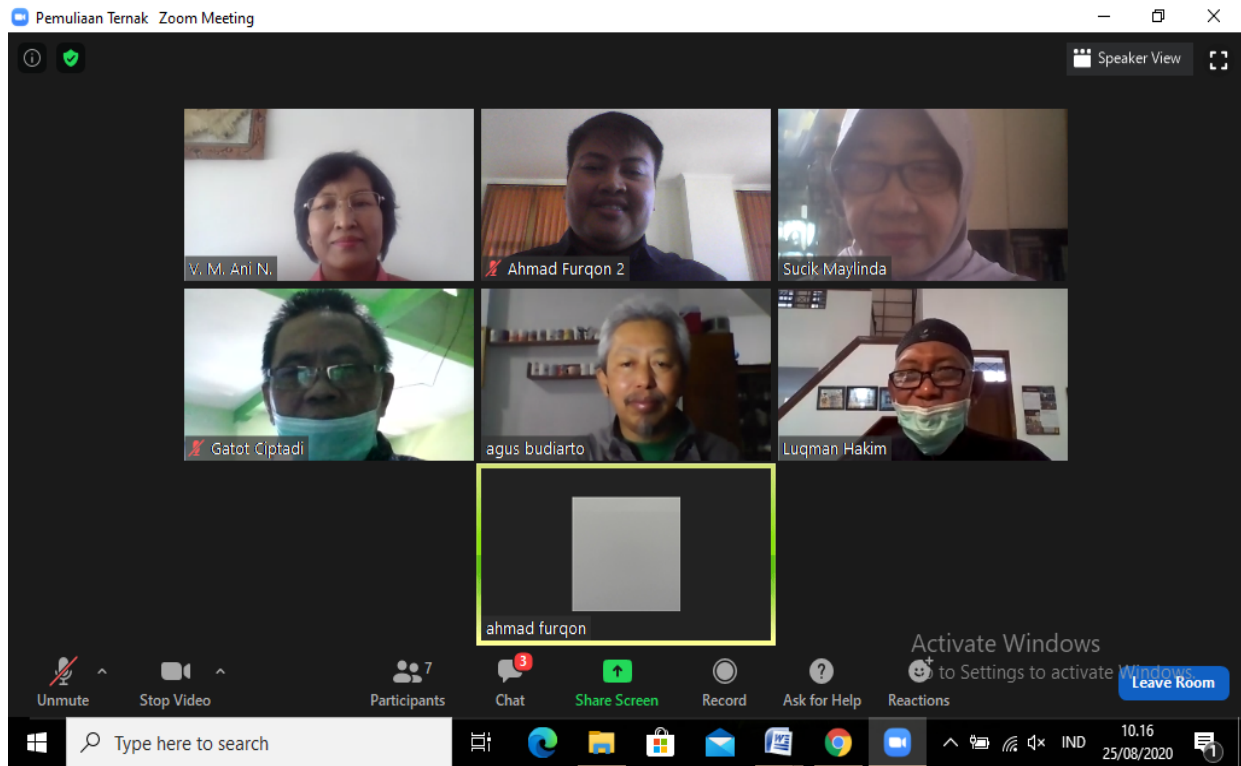
Lecture Portfolio

		UNIVERSITY OF BRAWIJAYA	
		FACULTY OF ANIMAL SCIENCE	
		DEPARTMENT OF ANIMAL SCIENCE	
Course: Livestock Breeding		Code: PEP 4009	RMK:
Semester: 5			
Lecturers	Prof.Dr.Ir.Luqman Hakim,MS. Prof.Dr.Ir.Sucik Maylinda,MS. Prof.Dr.Ir.V.M.Ani Nurgiartiningsih,MSc. Prof.Dr.Ir.Gatot Ciptadi,DESS. IPU, ASEAN Eng. Dr.Ir.Agus Budiarto,MS. Dr Ahmad Furqon, SPt		
Introduction (Describe the explanation needed about this course, experiences that have been conducted) This course encompasses understanding the concept of livestock breeding, qualitative and quantitative traits, estimated genetic parameters (heritability = h^2 , repeatability = r , genetic correlation = r_G), estimation of Breeding Value (BV), Most Probable Producing Ability (MPPA), Estimated Real Producing Ability (ERPA), estimation of selection response, correlated response, method of selecting one trait and more than one trait, and mating system			
1	Objective (Explain general and specific course objectives)		
	a. able to implement the basic principles of livestock breeding including genetic parameters, selection, genetic progress and regulation of the mating system b. Able to calculate and analyze livestock genetic potential, genetic parameters, and genetic progress due to selection c. Able to learn and develop self-learn insights in evaluating the implementation of livestock breeding programs in Indonesia		
2	Learning Strategy (Describe the strategies used to achieve course objectives - CLO/Course Learning Outcome)		
	The learning strategy is conducted by giving lectures, discussions, exercises, quizzes, structured assignments, group presentation assignments, practicum, midterm exam and final exam		
3	Lecture Management (Describe lecture management: lectures, tutorials, practicum, assignments, major assignments, etc.)		

	<ol style="list-style-type: none"> 1. Lecture is conducted for 2x50 minutes for 14 meetings (Outside Network) 2. Lecture is conducted for 1x50 minutes for 14 meetings (in the network) 3. Practicum is carried out 1x50 minutes for 14 meetings (Outside/In Network) 4. Exercise questions are held 2x before Midterm-test and 2x after Midterm-test 5. Self-structured assignments are carried out 1x before Midterm-test and 1x after Midterm-test 6. Quiz was conducted once before Midterm-test and 1x after Final Exam 7. Group presentations are done once before the Midterm-test and once after the Midterm-test
4	Lecture Contents (explain the suitability with the applicable curriculum) INTRODUCTION Estimation of genetic parameters (heritability, repeatability, genetic correlation) BV, MPPA and ERPA estimates Selection response estimates and correlated responses The method of selecting one trait and more than one trait Mating system (Inbreeding and Outbreeding)
5	Students (provide an overview of the lecture participants) The lecture participants are students of the Faculty of Animal Science who have passed the Prerequisite Course for Genetics and Statistics
6	Attendance (% lecturer's attendance; % students' attendance) Lecturer attendance percentage: 100% Student attendance percentage: at least 80%
7	Evaluation system (explain homework, quizzes, group assignments, practicum, etc.) <ol style="list-style-type: none"> 1. The practicum is conducted in 14 meetings with a duration of 1x50 minutes/meeting by performing simulation and data analysis 2. Quiz is held before and after Midterm-test 3. Self-structured assignments are given 1x before Midterm-test and 1x after Midterm-test 4. Group assignments are given 1x before Midterm-test and 1x after Midterm-test 5. Midterm test

	6. Final exams
8	Class Observation (Describe important and interesting things encountered during the lecture)
9	Learning Outcomes (explain the achievement of the goals that have been set, also include the learning achievements that can be explained)
	Able to develop comprehensive insight and mindset according to the science and field of the animal industry (PLO 4)
	Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science (LO6)
	Able to involve themselves in the learning process and discussion on an ongoing basis (PLO 10)
	Able to design and conduct experiments, analyze and interpret data to make correct decisions in solving problems in the field of animal science, meet ethics, and have environmental insight (PLO 12)
10	Obstacles (provide an overview of the main obstacles to learning)
11	Score Distribution (provide the score distribution along with the learning achievements of this course)
	Midterm Exam: 30%
	Final Exam: 30%
	Practicum Exam: 20%
	Structured Assignment and Quizzes: 10%
	Group Assignment: 10%
12	Conclusion
13	Improvement Recommendations
	Appendices:

	1.
	2.
	etc.



Pemuliaan Ternak Zoom Meeting

Speaker View

V. M. Ani N.

Ahmad Furqon 2

Sucik Maylinda

Gatot Ciptadi

agus budiarto

Luqman Hakim

ahmad furqon

Unmute

Stop Video

Participants 7

Chat

Share Screen

Record

Ask for Help

Reactions

Activate Windows
Go to Settings to activate Windows

Leave Room

Type here to search

10:17
25/08/2020