SEMESTER STUDY PLAN EUCLIDEAN GEOMETRY (COMPULSORY COURSE) Project Based Learning Method



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

2023



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

Cours	e Name	Course Code I-Learn Course URL		Credits	Semester	Compilation Date				
Euclidear	n Geometry	MAT61222	MAT61222 <u>https://sci.ilearn.unand.ac.id</u>		3	3	June 27, 2022			
Person	in Charge	Study Pla	an Creator	Head of Res	earch Group	the study program				
I CISOIL	in Charge	Dr. Ha	ripamyu	Dr. Har	ipamyu	Dr. Ar	rival Rince Putri			
Intended Learning	Intended Learning Ou	g Outcomes								
Outcomes (ILO) and Performance Indicators (PI)	ILO-4	An ability to us mathematical p PI-1: An al solving sim PI-2: An ability mathematic PI-3: An ability mathematic	e concept and fur roblems pility to choose ap ple mathematica to illustrate simp cal concepts and to to solve simple r cal concepts and t	ndamental tech propriate basi l problems le mathematica sechniques nathematical p	nique of math c mathematica al problems ba problems using	nematics in al concepts a ased on app g appropria	solving simple and techniques in propriate basic te basic			
	ILO-5	 An ability to formally and correctly proves a simple mathematical statements using fac 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 statement PI-3: An ability to present simple mathematical statement proof rigorously (sequential and conscientious) 								

		PI-4: An ability to conclude or interpret result of the proving simple mathematical statement
	ILO-7	An ability to communicate effectively especially in the area of mathematics in with diverse communities
		PI-1: An ability to convey ideas or study results orally, especially in the field of mathematics
		PI-2: An ability to present ideas or study results in writing, especially in the field of mathematics
		PI-3: An ability to respond to feedback given
	Course Learning Ou	tcomes (CLO)
	1. Student capable ex problem mathema	plain draft Euclidean geometry , esp geometry Euclid's incidence and use of it in finish tics related .(-4:IK-1)
	2. Student capable us mathematics relat	ee draft Euclidean geometry , esp geometry Euclid's incidence in finish problem ed .(ILO-4: IK-2, IK-3)
	3. Student capable pr	rove properties that apply to the plane / Euclidean space . (ILO-5: IK-1, IK-2, IK-3)
	4. Students are able t	o explain the concept of Afin Transformation. (ILO-4:IK-1)
	5. Students are able t 4:IK-2, IK-3)	o use the concept of Afin Transformation in solving related mathematical problems. (ILO-
	6. Students are able t	o communicate the results of their team discussions in the forum. (ILO-7: IK-1, IK-2, IK-3))
Brief description of MK	By concise fill eye stu- , translation , rotation field Euclid , Geomet	dying This is discuss geometry Euclid plane , including line, reflection , congruence , isometric n , reflection slide , period fixed and fixed line from isometric. Transformation affine to the ry Euclid dimensions three .
Study Material / Sub Study Material	1. Geometry Euclid p slide , period fixed dimensions three .	plane , including line, reflection , congruence , isometric , translation , rotation , reflection and fixed line from isometric. Transformation affine to the field Euclid , Geometry Euclid

References	Main :	References							
	1. Patrick J. Ryan, Eu	clidean and non-Euclidean Geometry	, an Analytic Approach , Cambridge Univ. Press, 1986						
	Aditionals :								
	1. Other relevant so	urces.	ces.						
Instructional Media	Device soft :		Instructional Media						
	LMS Unand (<u>http://fmipa.ilearn.unand.ac.id/</u>) Computer/Laptop								
	• Zoom meetings		Smartphones						
	• WhatsApp								
Team Teaching	Dr. Haripamyu								
Subject condition	Geometry Analytics , Elementary Linear Alg	eometry Analytics , lementary Linear Algebra							
Academic Norms	https://akademik.una 30%20Peraturan%20Re khusus%20Bab%20II.p	nd.ac.id/images/2022-03- ktor%20Nomor%207%20Tahun%202 <u>df</u>	022%20Penyelenggaraan%20Pendidikan-						

I. Weekly Lecture Plan

					Activ	ities/Forms of Le [Time estimated	arning []			
Week/	Course Outcomes	Indicators	Assessme	Synchron	ous *	Asynchi	ronous **			Weight
Meet (1)	(2)	(3)	nt (4)	Face to face Offline (5)	Face to face Online (6)	Individual (7)	Collaborative (8)	Media (9)	Subject, references (10)	(11)
1/1	 Student capable explain Rule Assessment , RPKPS, Syllabus as well as Contract Studying Students capable reviewing draft Field coordinate Euclid and space vector that will used 	 Discipline in carrying out college contracts Accurate understandin g of related material 	MIDTER M EXAM (2%)	 SL Introduction to RPS Studying : concept explanation, discussion and question and answer course material [1 x 3 x 50] minutes 		• A.M Students look for references according to the RPS and study lecture material: Analytical geometry of planes and space [1 x 3 x 120 minutes]		LMS (ilearn UNAND)	 RPKPS, Syllabus , Rule Assessment , and Lecture Rules The concept of the Euclidean coordinate plane The concept of vectors and 2- dimensional vector spaces. 	3%

2/2	Student capable explain concepts of vector spaces, inner products and properties that apply in inner product spaces	• Accurate understanding of related material	MIDTER M EXAM (2%)	 SL Studying : concept explanation discussion and question and answer course material [1 x 3 x 50 minutes] 	• A.M Students look for references and study material equations of circles and ellipses [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	Coordinate plane, vector space, inner product space	3%
3/3	Student capable explain the concept of distance and lines on a plane, and prove their properties	• Accurate understanding of related material	MIDTER M EXAM (3%)	 SL Studying : concept explanation discussion and question and answer course material x 3 x 50 minutes 	• A.M Students look for references and study material using TDK II and the substitution method to calculate definite integrals [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	Euclidean plane, line, orthonormal properties,	3%

4/4	Students are able to write the equation of a line in vector form and check the position of two lines	• Accurate understanding of related material	MIDTER M EXAM (3%)	 SL Studying : concept explanation discussion and question and answer course material X 3 x 50 minutes] 	• A.M Students look for references and study material on parametric equations and curvature of curves [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	line equation, Perpendicular, parallel and intersecting lines	3%
5/5	Students are able to write the equation of a line in vector form and check the position of two lines	• Accurate understanding of related material	MIDTER M EXAM (3%)	 SL Studying : concept explanation discussion and question and answer course material X 3 x 50 minutes] Tutorials X 3 x 50 minutes] 	• A.M Students look for references and study material rotation [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	Reflection, congruence, isometry	3%

6/6	Student capable explain draft reflection , congruence and isometrics in corner look vector .	• Accurate understanding of related material	MIDTER M EXAM (4%)	 SL Studying : concept explanation discussion and question and answer course material x 3 x 50 minutes 	• A.M Students look for references and study polar coordinates material [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	Translation , rotation	3%
7/7	Student capable explain draft translation and rotation in corner look vector	 Accurate understanding of related material Accuracy in answering quiz questions 	MIDTER M EXAM (4%) Quiz (5%)	 SL Studying : concept explanation discussion and question and answer course material x 3 x 50 minutes 	• A.M Students look for references and study material on the length of curves and tangent lines in polar coordinates [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	Shear reflection, fixed points and fixed lines of isometry -isometry	8%

8/8	Ability to explain the definition of affine transformations and their constant lines and prove their properties	• Accuracy in explaining and understandin g related material	FINAL EXAM (3%) Quiz (5%)	Studying : - concept explanation - discussion and question and answer course material [1 x 3 x 50 minutes]	Students look for references and study material on Cartesian coordinates in dimensional space three [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	Transformation composition [1]	8%
9/9	Ability to explain basic theorems of affine geometry, and affine reflection	 Accuracy in explaining and understandin g related material 	FINAL EXAM (3%)	Studying : - concept explanation - discussion and question and answer course material [1 x 3 x 50 minutes]	Students look for references and study material on vector-valued functions [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	Affine transformation, fixed line	3%
10/10	Ability to explain the concepts of shears, dilation, and similarity using vectors and image illustrations	 Accuracy in explaining and understandin g related material Accuracy in answering 	FINAL EXAM (3%) Quiz (5%)	Studying : - concept explanation - discussion and question and answer course material	Students look for references and study curvilinear motion [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	Basic Theorem of Affine Geometry, Affine reflection	3%

		quiz questions		[1 x 3 x 50 minutes]				
11/11	Ability to explain the concepts of rays and angles and prove the symmetry properties of segments and angles	 Accuracy in explaining and understandin g related material 	FINAL EXAM (3%)	Studying : - concept explanation - discussion and question and answer course material [1 x 3 x 50 minutes]	Students look for references and study the equations of tangent lines in three- dimensional space [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	Shears, dilation, similarity	3%
12/12	Ability to explain algebraic properties, inner product, length, cross product in 3- dimensional Euclidean space	 Accuracy in explaining and understandin g related material 	FINAL EXAM (4%)	Studying : - concept explanation - discussion and question and answer course material [1 x 3 x 50 minutes]	Students look for references and study tube coordinates [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	Ray, Corner Symmetry from segments and corners	4%
13/13	Ability to explain field concepts and construct fields	 Accuracy in explaining and understandin g related material Accuracy in answering 	FINAL EXAM (4%) Quiz (5%)	Studying : - concept explanation - discussion and question and answer course material	Students look for references and study spherical coordinates [1 x 3 x 120 minutes]	LMS (ilearn UNAND)	Euclidean geometry with three dimensions	9 %

		quiz questions		[1 x 3 x 50 minutes]						
14/14	Students are able to review material that has been discussed at meetings before MIDTERM EXAM until the 14th meeting.	 Skills in explaining in the form of presentations Accuracy of answers in discussions Skills in using mathematical software Accuracy in answering assignment questions Neatness in completing tasks Originality of task results 	Task (5 %) Presentati on (5 %)	Discussion/Pr esentation: - concept explanation - discussion and question and answer course material [1 x 3 x 50 minutes]		• A.M Students look for references independently regarding analytical geometry topics and use mathematical software to solve them [1 x 3 x 60 minutes]	• AK Students discuss in groups and make presentations in class [1 x 3 x 60 minutes]	LMS (ilearn UNAND)	Field	10 %
				Fir	nal Exam (30)%)				

Indicators , Criteria and Weights Evaluation

1. Weight Evaluation Every Form

NO	COMPONENT EVALUATION	WEIGHT (%)
Results	Assessment	

1	Task	10 %
2	Participation	10%
3	Quizes	10%
4	Midterm Exam	20 %
5	Big Projects / Assignments	30%
4	Final Exam/ Presentation	20%
	TOTAL	100

2. Weight Evaluation Every Achievements Course Learning

- CLO-1: 20 %
- CLO 2: 30 %
- CLO 3: 2 0 %
- CLO 4: 10 %
- CLO 5: 20 %

II. Assessment Plan Table

					Ι	Form ass	essmen	t			
CLOs		Tas	sk			Quizi	S		UTS	UAS	Total
CLOS											weight
	1	2	3	4	1	2	3	4			
1. Student capable explain and use	5%				5%		2%	1%	10%		20%
concepts and techniques base											
derivative in finish something											
problem mathematics related .(CP-											
4:P1-1, PI-2, PI-3);											
2. Students capable explain and use	1%			1%			2%	1%	5%	10%	30%
concepts and techniques basic integral											
in finish something problem											
mathematics related .(CP-4:P1-1, PI-2,											
PI-3)											

3. Students capable explain and use	1%	2%	2%			3%		2%		5%	20%
concepts and techniques base line											
function in finish something problem											
mathematics related .(CP-4:P1-1, PI-2,											
PI-3)											
4. Students capable explain			1%			1%			5%	5%	10%
generalization problem derivative and											
integral. (CP-3: PI-3)											
5. Students capable reason in a way				1%				4%	10%	10%	20%
intuitive and analytical and capable											
express results his reasoning in a way											
written , systematic and rigorous .											
(CP-5: PI-1, PI-2, PI-3)											
Total Weight	3%	2%	3%	2%	4%	4%	$4\overline{\%}$	8%	30%	30%	100%

Matrix of CLOs and ILOs

																IL	O															
		1			2			3			4			Į	5				6				7			8	3			ç)	
CLOs		PI			PI			PI			PI			ŀ	ΡI				PI				PI			P	ΡI			Р	Ί	
	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	~	\checkmark	S					~	\checkmark	✓								
2													\checkmark	\checkmark	~	\checkmark						~	\checkmark	✓								
3													\checkmark	\checkmark	~	\checkmark						~	\checkmark	~								

4																			
5							✓	\checkmark					\checkmark						
6					\checkmark	✓	\checkmark	~	~				~	~					

	Assessment rubric Progress / Progress Project									
Number										
Name/N	No. Member BP :									
1.										
2.										
Achieven	ments Learning assessed :									
CLO 4	Students are able to explain the concept of Afin Transformation. (CP-4:P1-1)									
CLO 5	Student capable use draft Deep Affine Transformation finish problem mathematics related .(CP-4:PI-2, PI-3)									
CLO 6	Students are able to work in teams (CP 8: PI-1,2)									
Subject :	Euclidean Geometry									

CPMK	Criteria	1	2	3	4
		Inferior	Average	Good	Excellent
4.5	a. Identification problem	Problems identified No in accordance with theme project planning	Problems identified in accordance with theme project planning but No explained with Good	Problems identified in accordance with theme project planning and done explained with Good	Problems identified in accordance with theme project planning and done explained with Good as well as served in a way systematic
	b. Identification concept required related problem	Unable explain with Good aspect identification need project .	Just capable explain with Good One from three aspect identification need project	Able to explain with well two of three aspect identification need project	Able to explain well all aspects of project needs identification
4.5	a. Identify the formal structure of a mathematical statement	Not able to explain well the aspects of identifying project needs.	Only able to explain well one of the three aspects of identifying project needs	Able to explain well two of the three aspects of project needs identification	Able to explain well all aspects of project needs identification
	b. The proof method used	The method used in the proof is not appropriate	The method used in the proof is appropriate but not used correctly	The method used in the proof is appropriate and used appropriately	The methods used in the proof are appropriate and used appropriately and systematically
	c. Facts and data used	Data used in project planning No appropriate	word used in project planning Already appropriate but No complete	Data used in project planning Already precise and complete	Data used in project planning Already precise and complete as well as served
	d. Presentation proof statement	Presentation proof No appropriate	Presentation proof complete But No in a way systematic	Presentation proof Already precise and complete as well as	Presentation proof Already precise and complete as well as served in a way systematic

			nor rigorous	served in a way systematic But not strict.	and rigorous.
6	Receive input, share information, and listen to other team members (peers)	team members are less willing to accept input, share information and listen to other team members	Team members are willing to partially accept input, share information and listen to other team members	Team members are good at receiving input, sharing information and listening to other team members	Team members excel at receiving input, sharing information and listening to other team members
	Completion of work according to the established schedule	Team members are always late in completing assigned tasks	Member team often late in finish Assigned job	Member team seldom late in finish Assigned job	Member team always appropriate time in finish Assigned job
	Participate in work with full responsibility	Member team No participate in work	Member team participate in work but No with full not quite enough answer	Team members participate in work responsibly	Team members participate in the work with full responsibility and dedication
	Response to every member team other	Member team not enough respond member team other in work	Member team Enough respond member team other in work	Member team respond with Good member team other in work	Member team respond very well member team other in work
		Assessment r	ubric Presentation End of Pro	oject / Task	

Number	r :				
Name/1	No. Member BP :				
1.					
2.					
Achieve	ements Learning a	ssessed :			
CLO 7	Students are able	to communicate the results of	their team discussions in the for	rum.	
Subject	: Euclidean Geom	etry			
CPMK	Criteria	1	2	3	4
		Inferior	Average	Good	Excellent
4	S arrangement material presentation	Presentation materials No arranged SERIN a way sort or logical	Most of the material presentation arranged in a way ordered , n	Most of the material presentation arranged in a way ordered and logical	Presentation material is arranged sequentially and logically
	Presentation material presentation	Unable explain with Good aspect identification need project .	Just capable explain with Good One from three aspect identification need project	Able to explain with well two of three aspect identification need project	Able to explain well all aspects of project needs identification
	Completeness material	Presentation materials only covers part small	Presentation materials covers part big report	Presentation materials covers	Presentation materials covers all report project with add information

presentation	report project	project	all report project	relevant support
Material presented	Material presented No relevant	Material presented relevant but served with No interesting and precise	The material presented is relevant and presented interestingly	The material presented is relevant and presented interestingly and systematically
Mastery material presentation	The presenter is not / partially big No control material presentation delivered	The presenter masters part material presentation delivered	The presenter masters material presentation delivered	The presenter masters material presentation delivered and capable hook with relevant information
Ability answer question	The presenter doesn't capable answer question audience	The presenter answers question audience with not enough Good	The presenter is capable answer question audience with Good	The presenter is capable answer question audience very well
Ability presentation	The presentation was delivered in a way that was not/less	Presentation be delivered with Enough	Presentation be delivered with	Presentation be delivered very interestingly

	interesting	interesting	interesting	
Speed and clarity delivery material	Material delivered with fast tempo and pronunciation not enough clear	Material delivered at a fast tempo with clear pronunciation	Material delivered with the right tempo and pronunciation not enough clear	Material delivered at the right tempo with clear pronunciation