

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

Universitas Negeri Surabaya Faculty of Mathematics and Natural Sciences Bachelor of Science Education Study Program

Document Code

UNES	A	Bachelor of Science Education Study Program													
				SE	MES	STE	R LE	ARN	IING	; Pl	_AN	1			
Courses				CODE			Course	Family		Cred	dit We	ight	SEMES	TER	Compilation Date
Laborato Safety	ry W	ork Management	and	842010316	1					T=3	P=0	ECTS=4.77		3	July 18, 2024
AUTHOR	RIZAT	TON		SP Develop	oer				Cours	e Clus	ster C	oordinator	Study F	Program C	oordinator
													Pr	of. Dr. Erm	an, M.Pd.
Learning model	ı	Project Based L	earnin	ıg											
Program Learning		PLO study prog	gram	that is char	ged to	the co	urse								
Outcom		Program Objec	tives	(PO)											
(PLO)		PLO-PO Matrix													
				P.O											
		PO Matrix at the end of each learning stage (Sub-PO)													
			F	P.O						1 1 .	- 10				
				1	2 3	4	5	6 7	8	9	10	11 1	2 13	14 1	15 16
Short Course Descript	tion	This course discusolutions, assess	isses I ing lab	aboratory ma oratory work	nageme , and pre	ent and eparing	administ SOPs.	ration, w	ork plar	nning a	and co	sts, laborato	ry work sa	afety and se	ecurity, making
Referen	ces	Main :													
		Teacher. 2. Sri Hiday	vati S. JawaT	2001. Penye imur di Madi	ediaan A un.	lat dan	Bahan	Praktiku	m.Makal	lah Pe	elatiha	n Teknisi La	ooratoriun	n Kimia/Bio	Handbook for logi Madrasah bitkan.
		Supporters:													
Supporting lecturer Dr. Siti Nurul Hidayati, S.Pd., M.Pd. Dr. Mohammad Budiyanto, S.Pd., M.Pd. Dr. Dyah Astriani, S.Pd., M.Pd. Dr. Hasan Subekti, S.Pd., M.Pd. Laily Rosdiana, S.Pd., M.Pd.															
			Ev	aluation	1			Help Learning, Learning methods, Student Assignments, [Estimated time]			Learning materials	Assessment Weight (%)			
	(Su	b-PO)	h	ndicator	Crit	teria &	Form		ine (ine)	C	nline	(online)	Littere	. Choca j	

	1		T	1	1	
1	 Utilize science 	 Explain the 	Criteria:	1. Student-	Material: Lab	5%
	and technology to	meaning of	1.Score	centered	Functions	
	teach how to use	laboratory 2.	2.Rubric	learning	Reader: Sri	
	laboratory	Get to know	3.4	approach	Hidayati S. 2001.	
	equipment, and	laboratory		(student-	Provision of	
	explore information	equipment and	4.The presentation		Practical Tools	
	related to laboratory	its functions 3. Explain types of	was carried out	centered learning) 2.	and Materials.	
	equipment and	laboratories 4.	coherently with			
	managerial	Explain	appropriate	Deductive	Training Paper for	
	functions in the	laboratory	intonation and	learning	Chemistry/Biology	
	laboratory 2. Can	functions in	emphasis,	method 3.	Laboratory	
	master theoretical	relation to		Strategy	Technicians at	
	concepts (Facts,	laboratory types	assisted by ppt	Lectures,	Madrasah Aliah	
	Concepts,		media according	discussions,	throughout East	
	Principles,		to media criteria,	presentations	Java in Madiun.	
	Theories) in the		the answer from	6 X 50		
	field of		the questioner			
	science/science		was correct,			
	laboratory		formulating			
	management related to		suggestions for			
	managerial					
	functions, as well		improvement			
	as able to		5.3			
	formulate several		6.The presentation			
	alternative		was carried out			
	solutions to		coherently with			
	problems		intonation and			
	procedurally in the laboratory linked to		but did not			
	a scientific		emphasize the			
	a scientific approach, to: plan,		important			
	manage and		•			
	evaluate the		aspects of the			
	implementation of		research, with			
	the science		the help of ppt			
	laboratory for which he is		media according			
	responsible		to media criteria,			
			the answers from			
			the questioner			
			were generally			
			correct,			
			formulating			
			suggestions for			
			improvement			
			7.2			
			8.The presentation			
			was carried out,			
			was not coherent			
			and/or did not			
			emphasize			
			important			
			aspects of the			
			research, was			
			assisted by ppt			
			, , , ,			
			media but did not			
			meet the media			
			criteria, the			
			answers from the			
			questioner were			
			generally			
			incorrect,			
			formulated			
			suggestions for			
			improvement			
			9.1			
			10.The			
			presentation was			
			carried out, but			
			was not coherent			
			and/or did not			
			emphasize			
			important			
			aspects of the			
			research, was			
			not assisted by			
			ppt media, the			
			answer from the			
			questioner was			
			incorrect, unable			
			to formulate			
			suggestions for			
			improvement			
			Farm of A			
			Form of Assessment			
			Particinatory Activities			
			Participatory Activities			
			l			

_	1	1 Fymlein (b.)	Ouit-ui-	1 (4 1	Managini I	F0.
2	Utilize science and technology to	Explain the meaning of	Criteria:	Student- centered	Material: Definition and	5%
	teach how to use	laboratory 2.	1.Score			
	laboratory	Get to know	2.Rubric	learning	types of Lab	
	equipment, and	laboratory	3.4	approach	Library:	
	explore information	equipment and	4.The presentation	(student-	Supriono, Sri	
	related to	its functions 3.	was carried out	centered	Hidayati and	
	laboratory equipment and	Explain types of laboratories 4.	coherently with	learning) 2.	Isnawati. 2011.	
	managerial	Explain	appropriate	Deductive	Training or	
	functions in the	laboratory	intonation and	learning	Development of	
	laboratory 2. Can	functions in	emphasis,	method 3.	East Java School	
	master theoretical	relation to	assisted by ppt	Strategy	Laboratory	
	concepts (Facts,	laboratory types	media according	Lectures,	Assistants.	
	Concepts,		to media criteria,	discussions,	Handout,	
	Principles, Theories) in the		the answer from	presentations 6 X 50	unpublished.	
	field of		the questioner	0 \ 30		
	science/science					
	laboratory		was correct,			
	management related to		formulating			
	managerial		suggestions for			
	functions, as well		improvement			
	as able to		5.3			
	formulate several		6.The presentation			
	alternative		was carried out			
	solutions to problems		coherently with			
1	procedurally in the		intonation and			
	laboratory linked to		but did not			
1	a scientific		emphasize the			
1	approach, to: plan,		important			
1	manage and evaluate the		aspects of the			
1	implementation of		research, with			
	the science		the help of ppt			
1	laboratory for		media according			
	which he is responsible		to media criteria,			
	гезропоівіс		the answers from			
			the questioner			
			were generally			
			correct,			
			formulating			
			suggestions for			
			improvement			
			7.2			
			8.The presentation			
			was carried out,			
			was not coherent			
			and/or did not			
			emphasize			
			important			
			aspects of the			
			research, was			
			assisted by ppt			
			media but did not			
			meet the media			
			criteria, the			
			answers from the			
1			questioner were			
1			generally			
1			incorrect,			
1			formulated			
1			suggestions for			
			improvement			
1			9.1			
1			10.The			
1			presentation was			
1			carried out, but			
			was not coherent			
1			and/or did not			
1			emphasize			
1			important			
1			aspects of the			
			research, was			
			not assisted by			
			ppt media, the			
1			answer from the			
			questioner was			
			incorrect, unable			
			to formulate			
			suggestions for			
			improvement			
			-			
			Form of Assessment			
			: Danifalia A			
			Portfolio Assessment			
		<u> </u>		i		

3	1. Utilize science and technology to teach how to use laboratory equipment, and explore information related to laboratory equipment and managerial functions in the laboratory 2. Can master theoretical concepts (Facts, Concepts, Principles, Theories) in the field of science/science laboratory management related to managerial functions, as well as able to formulate several alternative solutions to problems procedurally in the laboratory linked to a scientific approach, to: plan, manage and evaluate the implementation of the science laboratory for which he is responsible	1. Able to plan the construction of the laboratory from the perspective of the location 2. Able to create an ideal floor plan for the laboratory 3. Make an inventory list of tools and materials needed by the science laboratory	Criteria: 1.correct description 2.3: the description is generally correct, there is one aspect where the explanation is incorrect 3.2: the description is generally correct, there is more than one aspect where the explanation is incorrect 4.1: the description is wrong	Student-centered learning approach (student-centered learning) Deductive learning method Strategy Lectures, discussions, presentations 6 X 50	Material: Lab Planning Reader: Supriono, Sri Hidayati and Isnawati. 2011. Training or Development of East Java School Laboratory Assistants. Handout, unpublished.	5%

	and technology to teach how to use laboratory equipment, and explore information related to laboratory equipment and managerial functions in the laboratory 2. Can master theoretical concepts (Facts, Concepts, Principles, Theories) in the field of science/science laboratory management related to managerial functions, as well as able to formulate several alternative solutions to problems procedurally in the laboratory linked to a scientific approach, to: plan, manage and evaluate the implementation of the science laboratory for which he is responsible	the construction of the laboratory from the perspective of the location 2. Able to create an ideal floor plan for the laboratory 3. Make an inventory list of tools and materials needed by the science laboratory	1.Score 2.Rubric 3.4 4.The presentation was carried out coherently with appropriate intonation and emphasis, assisted by ppt media according to media criteria, the answer from the questioner was correct, formulating suggestions for improvement 5.3 6.The presentation was carried out coherently with intonation and but did not emphasize the important aspects of the research, with the help of ppt media according to media criteria, the answers from the questioner were generally correct, formulating suggestions for improvement 7.2 8.The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answers from the questioner was incorrect, unable to formulate suggestions for improvement	centered learning approach (student-centered learning) Deductive learning method Strategy Lectures, discussions, presentations 3 X 50		use lab equipment Reference: Bettelheim & Landesberg.2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teachers.	
--	---	--	---	---	--	---	--

	1				T	1	
5	Can master	1.Can assess	Criteria:	Student-		Material: Lab	10%
	theoretical	laboratory	1.Score	centered		management	
	concepts (Facts,	function	2.Rubric	learning		Library:	
	Concepts,			approach		Bettelheim &	
	Principles,	from a	3.4	(student-		Landesberg.2000.	
	Theories) in the	cognitive,	4.The presentation	centered		Laboratory	
	field of science	psychomotor	was carried out	learning)		Experiments for	
	laboratory	and affective	coherently with			General.	
	management	perspective	appropriate	Deductive		/	
	related to	2.Write a	intonation and	learning		Organics, and	
	managerial		emphasis,	method		Biochemistry	
	functions, as well	report of	•	Strategy		Laboratory	
	as being able to	observation	assisted by ppt	Lectures,		Handbook for	
	formulate several	results to the	media according	discussions,		Teachers.	
	alternative	laboratory	to media criteria,	presentations			
	solutions to	,	the answer from	3 X 50			
	procedural		the guestioner	07.00			
	problems in the		was correct,				
	laboratory linked to						
	a scientific		formulating				
	approach, to: plan,		suggestions for				
	manage and		improvement				
	evaluate laboratory		5.3				
	management Science, which is		6.The presentation				
	its responsibility, is		was carried out				
	able to make						
	appropriate		coherently with				
	decisions based on		intonation and				
	analyzing		but did not				
	information and		emphasize the				
	data and		important				
	communicating		aspects of the				
	-		research, with				
			'				
			the help of ppt				
			media according				
			to media criteria,				
			the answers from				
			the questioner				
			were generally				
			• ,				
			correct,				
			formulating				
			suggestions for				
			improvement				
			7.2				
			8.The presentation				
			was carried out,				
			was not coherent				
			and/or did not				
			emphasize				
			important				
			aspects of the				
			•				
			research, was				
			assisted by ppt				
			media but did not				
			meet the media				
			criteria, the				
			answers from the				
			questioner were				
			generally				
			incorrect,				
			· ·				
			formulated				
			suggestions for				
			improvement				
			9.1				
			10.The				
			presentation was				
			carried out, but				
			was not coherent				
			and/or did not				
			emphasize				
			important				
			aspects of the				
			•				
			research, was				
			not assisted by				
			ppt media, the				
			answer from the				
			questioner was				
			incorrect, unable				
			to formulate				
1	ĺ		suggestions for				
		l.					
			improvement				

Principles, Theories) in the field of science/science laboratory management related to managerial functions, as well as being able to formulate several alternative solutions to procedural problems in the laboratory linked to a scientific approach, to: plan, manage and evaluate laboratory management Science, which is its responsibility, is able to make appropriate decisions based on analyzing information and data and communicating	from a cognitive, psychomotor and affective perspective 2. Write a report of observation results to the laboratory	3.4 4. The presentation was carried out coherently with appropriate intonation and emphasis, assisted by ppt media according to media criteria, the answer from the questioner was correct, formulating suggestions for improvement 5.3 6. The presentation was carried out coherently with intonation and but did not emphasize the important aspects of the research, with the help of ppt media according to media criteria, the answers from the questioner were generally correct, formulating suggestions for improvement 7.2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media the not media the not media the not media the not	learning Deductive learning method Strategy Lectures, discussions, presentations 3 X 50	Bettelheim & Landesberg, 2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teachers.	
		: Participatory Activities			

theoretical concepts (Fetts, Ornellos) (and the presentation to th		 			I		1
Concepts. Concepts. Concepts. Concepts. Theories) in the find of more proported participation of subcoutory management procedural functions, as well a function and a scientific upproach to plan, as scientific upproach to practice of the proposition for the proposition fo	7						5%
Concepts, Theories) in the field of community control of the community of			•				
Principles (minute control of the co		Concepts,					
field of management end affective perspective related to the coherently with appropriate intronations and affective perspective perspective enders on the coherent perspective		Principles,					
science-become laboratory related to laboratory related to managerial svell as being able to formulate several problems in the property of the		Theories) in the					
laboratory management management management management management solutions to problem in the laboratory solution to problem in the laboratory solution to problem in the laboratory solutions to problem in the laboratory solution to problem in the solution to problem							
management physiopicity appropriate infrontation and physiopicity of functions, as well as being able to the problems in the laboratory solutions to problems in the laboratory solution and construction of the laboratory solution is its responsibility, is able to make according to media cardina, the answer from the questioner was carried out coherently with intonsion and decisions based on analyzing and data and communicating and communicating to media cardina, with the help of ppt media according to media cardina, with the help of ppt media according to media cardina, with the help of ppt media according to media cardina, with the help of ppt media according to media cardina, with the help of ppt media according to media cardina, which is coherently with intonsion and decisions based on analyzing and data and communicating according to media cardina, with the help of ppt media according to media cardina, which is coherently with intonsion and decisions and decisions and decisions and the proposal potential approach to the research, with the help of ppt media according to media crieria, which is coherently with intonsion and decisions and deci							
managerial functions; as well functions; as well functions; as well observation or results to the laboratory procedural problems in the laboratory observation of the laboratory observation observation of the laboratory observation observati		management					
functions, as well as being able to media according to the media according to media according to media according to media cordinative solutions in the laboratory linked to a scientific a scientific a scientific as scientific as scientific as according to media criteria, the answer from the questioner was cornect, as scientific as scientification as scientific as scientification as scientific as scientification as scientific as scientification as						Organics, and	
as being able to formulate several research to the secondary of the second				•		Biochemistry	
formulate several alternative alternative short and the answer from the procedural problems in the laboratory based to approach, to plan, manage and rangement Science, which is its responsibility, is appropriate decisions based on analyzing diata and communicating and communicating decisions based on analyzing of the communicating diata and communicating and diata and communicating diata and communicating and diata a							
solutions to be proceeding the laboratory in the auswer from the questioner was correct, formulating suggestions for improvement special part of the control		formulate several					
procedural problems in the de to a scientific approach, to plan, manage and manage ment science, which is a scientific approach, to plan, manage ment science, which is a she to make appropriate decisions based on a continumation and data and communicating and communicating as a scientific as a scientific and communicating as a scientific as a scientific as a scientific and a scientific as a scientific a			laboratory	· ·		Teachers.	
problems in the laboratory linked to approach, to plan, manage and evaluate laboratory scholars of the properties of the							
laboratory inked to a scientific serior of the control of the cont				•			
approach, to plan, manage and evaluate laboratory (and a second property) and the property of the presentation (and a second property) and the property of the presentation (and a second property) and the property of the presentation (and the property) and the property of the presentation (and the property) and the property of the presentation (and the property) and the property of the presentation (and the property) and the property of the presentation (and the property) and the property of the presentation (and the property) and the property of the presentation (and the property) and the property of the presentation (and the property) and the property of the presentation (and the property) and the property of the presentation (and the property) and the presentation (and the property) and the property of the presentation (and the property) and the property of the pr		laboratory linked to					
misnage and evaluate laboratory in the state of the presentation is its responsibility, is able to make decisions based on analyzing information and different communicating decisions based on analyzing information and different communicating decisions based on analyzing information and but did not emphasize the important aspects of the responsibility of the help of pat media according to media criteria, the enswers from the questioner were generally correct, formulating suggestions for improvement 7, 2. 2. 2. 3. The presentation was not coherent aspects of the research, was assisted by pat media in the network of				•			
evaluate laboratory management Sit is responsibility, is able to make appropriate decisions based on an information and data and communicating appropriate aspects of the research, with the help of pot media according to media criteria, the aspects from the questioner were generally formulating assisted by pot media according to media criteria, the answers from the questioner were generally formulating suggestions for improvement 7.2 8. The presentation was carried out, was not coherent anafor did not emphasize important aspects of the research, was assisted by pot media bat did not emphasize important aspects of the research was assisted for not media tid not emphasize important aspects of the research was assisted by pot media bat did not emphasize important portant aspects of the research was assisted by pot media bat did not emphasize generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize miportant aspects of the presentation was carried out, but was not coherent and/or did not emphasize miportant material or did not emphasize miportant and/or did not emphasize miportant material or did not emphasize mipor							
Science, which is its responsibility, is able to make appropriate on considering information and data and communicating communication communication communication communication communication communication communicating communication communication communication communication communication communic							
its responsibility, is able to make appropriate decisions based on information and data and data and data and data and data and decisions based on the research, with the help of ppt media according to media criteria, the answers from the questioner were quenerally correct, formulating suggestions for improvement 7.2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was not asset to ppt media according to media criteria, the answer from the questioner were quentally correct, formulating suggestions for improvement 7.2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by pp media but did not meet the media of t							
able to make appropriate decisions based on the communicating and data and communicating and data and communicating to media according suggestions for improvement according to the media according to th							
appropriate decisions based on analyzing and the data and data and communicating emphasize the important aspects of the research, with the help of ppt media according to media criteria, the answers from the questioner were generally correct, formulating suggestions for improvement 7.2 8. The presentation was carried out, was not otherent and/or did not emphasize important aspects of the research, was assisted by ppt media activate, the answers from the questioner were generally correct, formulating suggestions for improvement 7.1 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1							
decisions based on analyzing information and dispersion of the management of the man		appropriate		•			
emphasize the important aspects of the research, with the help of pat media according to media criteria, the answers from the questioner were generally correct, formulating suggestions for improvement 7.2. 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by pp media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 2.1. 10. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by pp media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.		decisions based on					
data and communicating aspects of the research, with the help of ppt media according to media according to media according to media critenta, the answers from the questioner were generally correct, formulating suggestions for improvement 7,2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9,1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but continued to suggestions for improvement 9,1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulatet suggestions for							
aspects of the research, with the help of ppt media according to media criteria, the answers from the questioner were generally correct. formulating suggestions for 200 years and 200 years are also years and 200 years and 200 years are also years and 200 years and 200 years are also years and 200 years a				•			
research, with the help of ppt media according to media criteria, the answers from the questioner were generally correct. formulating suggestions for improvement 7.2 3. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1. 10. The presentation was carried out, but was not coherent and/or did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1. 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by pt pt media, the answer from the questioner was not assisted by pt pt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
the help of ppt media according to media activation, the answers from the questioner were generally correct, formulating suggestions for improvement 7.2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important suspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner muse incorrect, unable to formulate suggestions for				•			
media according to media criteria, the answers from the questioner were generally correct. formulating suggestions for improvement 7.2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1. 10. The presentation was carried out, but was not coherent and/or did not emphasize improvement 9.1. 10. The presentation was carried out, but was not coherent and/or did not emphasize important asspects of the research, was according to the presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
the answers from the questioner were generally correct, formulating suggestions for improvement 7.2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not osherent and/or did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				media according			
the questioner were generally correct. formulating suggestions for improvement 7.2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 1.1.1.0.The presentation was carried out, but was not coherent and/or did not emphasize improval to the presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				to media criteria,			
were generally correct, formulating suggestions for improvement 7.2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 1.1.1.0.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, but and and a criteria, the answer from the questioner were generally incorrect, formulated suggestions for improvement 9.1 2.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1				the answers from			
correct, formulating suggestions for improvement 7.2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate				the questioner			
formulating suggestions for improvement 7.2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, the formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				• ,			
suggestions for improvement 7.2 8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, the presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate				· ·			
improvement 7.2 8.The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate							
8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, and assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
8. The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10. The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate							
was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate							
and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate							
important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate							
research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				•			
assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				•			
media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				, , , ,			
criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				generally			
suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				· ·			
improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				•			
and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				· ·			
emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				•			
research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for				•			
ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for							
answer from the questioner was incorrect, unable to formulate suggestions for				-			
questioner was incorrect, unable to formulate suggestions for							
incorrect, unable to formulate suggestions for							
suggestions for suggestions for				•			
				to formulate			
improvement							
improvement				improvement			

8	Can master theoretical concepts (Facts, Concepts, Principles, Theories) in the field of science/science laboratory management related to managerial functions	1.Explain the meaning of laboratory 2.Get to know laboratory equipment and its functions 3.Explain the types of laboratories 4.Explain the function of the laboratory in relation to the type of laboratory	Criteria: 1.4: correct description 2.3: the description is generally correct, there is one aspect where the explanation is incorrect 3.2: the description is generally correct, there is more than one aspect where the explanation is incorrect 4.1: the description is wrong	Student- centered learning approach (student- centered learning) 3 X 50			0%
---	---	---	---	--	--	--	----

	Litilingi	Evals:-	Ouit-ui-	al:	Bankani I II .	100/
9	Utilize science and technology to teach	Explain laboratory	Criteria:	discussion,	Material: Use of	10%
1	how to use	management	1.Score	presentation 3 X 50	lab equipment Reference: Sri	
1	laboratory	Make planning	2.Rubric 3.4	5 A 30	Hidayati S. 2001.	
	equipment, and	for procurement of tools and			Provision of	
1	explore information related to	materials	4.The presentation was carried out		Practical Tools	
	laboratory		coherently with		and Materials.	
	equipment and		appropriate		Training Paper for	
	managerial functions in the		intonation and		Chemistry/Biology	
	laboratory. Can		emphasis,		Laboratory	
	master theoretical		assisted by ppt		Technicians at	
	concepts (Facts,		media according		Madrasah Aliah	
	Concepts,		to media criteria,		throughout East	
	Principles, Theories) in the		the answer from		Java in Madiun.	
	field of		the questioner			
	science/science		was correct,			
	laboratory management		formulating			
	related to		suggestions for			
	managerial		improvement			
	functions, and be		5.3			
	able to formulate several alternatives		6.The presentation			
	Procedural		was carried out			
	problem solving in		coherently with			
	the laboratory is		intonation and			
	linked to a scientific		but did not			
	approach, to: plan, manage and		emphasize the			
1	evaluate the		important			
	implementation of		aspects of the			
	the science		research, with			
	laboratory for which they are		the help of ppt			
	responsible Able to		media according			
	make appropriate		to media criteria,			
	decisions based on		the answers from			
	analysis of information and		the questioner			
	data and		were generally			
	communicate to the		correct,			
	public in		formulating			
	accordance with applicable		suggestions for			
	regulations		improvement			
	Responsible for the		7.2			
	work carried out as a form of self-		8.The presentation			
	learning and being		was carried out,			
	able to provide		was not coherent			
	reports on work		and/or did not			
	results related to activities in the		emphasize			
	science laboratory		important			
			aspects of the			
			research, was			
			assisted by ppt			
			media but did not			
			meet the media			
			criteria, the			
			answers from the			
1			questioner were			
			generally			
1			incorrect,			
			formulated			
1			suggestions for improvement			
			9.1			
1			10.The			
			presentation was			
1			carried out, but			
			was not coherent			
1			and/or did not			
			emphasize			
1			important			
			aspects of the			
1			research, was			
1			not assisted by			
1			ppt media, the			
1			answer from the			
			questioner was			
1			incorrect, unable			
			to formulate			
1	i l			1		
			suggestions for			
			suggestions for improvement			

10	Utilize science and technology to teach	Explain laboratory	Criteria: 1.Score	discussion, presentation	Material: Use of lab equipment	10%
	how to use	management	2.Rubric	3 X 50	Reference: Sri	
	laboratory equipment, and	Make planning for procurement	3.4		Hidayati S. 2001.	
	explore information	of tools and	4.The presentation		Provision of Practical Tools	
	related to laboratory	materials	was carried out		and Materials.	
	equipment and		coherently with		Training Paper for	
	managerial functions in the		appropriate intonation and		Chemistry/Biology	
	laboratory. Can		emphasis,		Laboratory Technicians at	
	master theoretical concepts (Facts,		assisted by ppt		Madrasah Aliah	
	Concepts,		media according		throughout East	
	Principles, Theories) in the		to media criteria, the answer from		Java in Madiun.	
	field of		the questioner			
	science/science laboratory		was correct,			
	management		formulating			
	related to managerial		suggestions for improvement			
	functions, and be able to formulate		5.3			
	several alternatives		6.The presentation			
	Procedural problem solving in		was carried out			
	the laboratory is		coherently with intonation and			
	linked to a scientific approach, to: plan,		but did not			
	manage and		emphasize the			
	evaluate the implementation of		important			
	thė science		aspects of the research, with			
	laboratory for which they are		the help of ppt			
	responsible Able to		media according			
	make appropriate decisions based on		to media criteria,			
	analysis of information and		the answers from the questioner			
	data and		were generally			
	communicate to the public in		correct,			
	accordance with		formulating suggestions for			
	applicable regulations		improvement			
	Responsible for the		7.2			
	work carried out as a form of self-		8.The presentation			
	learning and being		was carried out, was not coherent			
	able to provide reports on work		and/or did not			
	results related to activities in the		emphasize			
	science laboratory		important			
			aspects of the research, was			
			assisted by ppt			
			media but did not			
			meet the media criteria, the			
			answers from the			
1			questioner were			
1			generally			
			incorrect, formulated			
			suggestions for			
			improvement			
			9.1 10.The			
			presentation was			
			carried out, but			
			was not coherent			
			and/or did not emphasize			
			important			
			aspects of the			
			research, was			
			not assisted by ppt media, the			
			answer from the			
			questioner was			
			incorrect, unable			
			to formulate suggestions for			
			improvement			
<u> </u>						

	technology to teach how to use laboratory equipment, and explore information related to laboratory equipment and managerial functions in the laboratory. Can master theoretical concepts (Facts, Concepts, Principles, Theories) in the field of science/science laboratory management related to managerial functions, and be able to formulate several alternatives Procedural problem solving in the laboratory is linked to a scientific approach, to: plan, manage and evaluate the implementation of the science laboratory for which they are responsible Able to make appropriate decisions based on analysis of information and data and communicate to the public in accordance with applicable regulations Responsible for the work carried out as a form of self-learning and being able to provide reports on work results related to activities in the science laboratory	safety efforts in the laboratory Making laboratory regulations related to work safety including making SOPs Listing the work safety equipment needed in the laboratory Recognizing danger symbols in the laboratory Able to make solutions safely Caring for laboratory equipment	1.Score 2.Rubric 3.4 4.The presentation was carried out coherently with appropriate intonation and emphasis, assisted by ppt media according to media criteria, the answer from the questioner was correct, formulating suggestions for improvement 5.3 6.The presentation was carried out coherently with intonation and but did not emphasize the important aspects of the research, with the help of ppt media according to media criteria, the answers from the questioner were generally correct, formulating suggestions for improvement 7.2 8.The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not coherent and/or did not emphasize important aspects of the research, was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for improvement was incorrect, unable to formulate suggestions for improvement improvement		learning approach. Deductive learning method. Discussion strategy, presentation 3 X 50	Readers: Supriono, Sri Hidayati and Isnawati. 2011. Training or Development of East Java School Laboratory Assistants. Handout, unpublished.	
--	---	---	---	--	--	--	--

	technology to teach how to use laboratory equipment, and explore information related to laboratory equipment and managerial functions in the laboratory. Can master theoretical concepts (Facts, Concepts, Principles, Theories) in the field of science/science laboratory management related to managerial functions, and be able to formulate several alternatives Procedural problem solving in the laboratory is linked to a scientific approach, to: plan, manage and evaluate the implementation of the science laboratory for which they are responsible Able to make appropriate decisions based on analysis of information and data and communicate to the public in accordance with applicable regulations Responsible for the work carried out as a form of self-learning and being able to provide reports on work results related to activities in the science laboratory	safety efforts in the laboratory Making laboratory regulations related to work safety including making SOPs Listing the work safety equipment needed in the laboratory Recognizing danger symbols in the laboratory Able to make solutions safely Caring for laboratory equipment	1.Score 2.Rubric 3.4 4.The presentation was carried out coherently with appropriate intonation and emphasis, assisted by ppt media according to media criteria, the answer from the questioner was correct, formulating suggestions for improvement 5.3 6.The presentation was carried out coherently with intonation and but did not emphasize the important aspects of the research, with the help of ppt media according to media criteria, the answers from the questioner were generally correct, formulating suggestions for improvement 7.2 8.The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media but did not emphasize important aspects of the research, was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for improvement		learning approach. Deductive learning method. Discussion strategy, presentation 3 X 50	Preparation of solutions References: Supriono, Sri Hidayati and Isnawati. 2011. Training or Development of East Java School Laboratory Assistants. Handout, unpublished.	
--	---	---	--	--	--	--	--

Т

_

	how to use laboratory equipment, and explore information related to laboratory equipment and managerial functions in the laboratory. Can master theoretical concepts (Facts, Concepts, Principles, Theories) in the field of science/science laboratory management related to managerial functions, and be able to formulate several alternatives Procedural problem solving in the laboratory is linked to a scientific approach, to: plan, manage and evaluate the implementation of the science laboratory for which they are responsible Able to make appropriate decisions based on analysis of information and data and communicate to the public in accordance with applicable regulations Responsible for the work carried out as a form of self-learning and being able to provide reports on work results related to activities in the science laboratory	observational data through presentations. Can answer audience questions related to the data presented	2.Rubric 3.4 4.The presentation was carried out coherently with appropriate intonation and emphasis, assisted by ppt media according to media criteria, the answer from the questioner was correct, formulating suggestions for improvement 5.3 6.The presentation was carried out coherently with intonation and but did not emphasize the important aspects of the research, with the help of ppt media according to media criteria, the answers from the questioner were generally correct, formulating suggestions for improvement 7.2 8.The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for improvement		(student-centered learning) Learning method is deductive, discussion, presentation 3 X 50	Reference: Bettelheim & Landseberg.2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teachers.	
--	---	---	---	--	---	---	--

	I		ı	1	1		
14	Utilize science and	Can	Criteria:	Student-		Material:	5%
	technology to teach	communicate	1.Score	centered		Observation and	
	how to use	observational	2.Rubric	learning		application of lab	
	laboratory equipment, and	data through presentations.	3.4	approach		management in	
	equipment, and explore information	Can answer	4.The presentation	(student-		schools	
	related to	audience	was carried out	centered		Reference:	
	laboratory	questions	coherently with	learning)		Bettelheim &	
	equipment and	related to the	,	Deductive		Landesberg.2000.	
	managerial	data presented	appropriate	learning		Laboratory	
	functions in the		intonation and	method		Experiments for	
	laboratory. Can		emphasis,	Discussion		General,	
	master theoretical concepts (Facts,		assisted by ppt	strategy,		Organics, and	
	Concepts,		media according	presentation		Biochemistry	
	Principles,		to media criteria,	3 X 50		Laboratory	
	Theories) in the		the answer from	0 70 00		Handbook for	
	field of		the questioner			Teachers.	
	science/science		was correct,			reachers.	
	laboratory						
	management		formulating				
	related to managerial		suggestions for				
	functions, and be		improvement				
	able to formulate		5.3				
	several alternatives		6.The presentation				
	Procedural		was carried out				
	problem solving in		coherently with				
	the laboratory is		intonation and				
	linked to a scientific approach, to: plan,		but did not				
	manage and		emphasize the				
	evaluate the		important				
	implementation of		aspects of the				
	the science		research, with				
	laboratory for						
	which they are responsible Able to		the help of ppt				
	make appropriate		media according				
	decisions based on		to media criteria,				
	analysis of		the answers from				
	information and		the questioner				
	data and		were generally				
	communicate to the		correct,				
	public in accordance with		formulating				
	applicable		suggestions for				
	regulations		improvement				
	Responsible for the		7.2				
	work carried out as		8.The presentation				
	a form of self-		was carried out,				
	learning and being		was not coherent				
	able to provide reports on work		and/or did not				
	results related to						
	activities in the		emphasize				
	science laboratory		important				
	-		aspects of the				
			research, was				
			assisted by ppt				
			media but did not				
			meet the media				
			criteria, the				
			answers from the				
			questioner were				
			generally				
			incorrect,				
			formulated				
			suggestions for				
			improvement				
			9.1				
			10.The				
			presentation was				
			carried out, but				
			was not coherent				
			and/or did not				
			emphasize				
			•				
			important				
			aspects of the				
			research, was				
			not assisted by				
			ppt media, the				
			answer from the				
			questioner was				
			incorrect, unable				
			to formulate				
			suggestions for				
			improvement				
			improveillent				
			1		1		

16	how to use laboratory equipment, and explore information related to laboratory equipment and managerial functions in the laboratory. Can master theoretical concepts (Facts, Concepts, Principles, Theories) in the field of science/science laboratory management related to managerial functions, and be able to formulate several alternatives Procedural problem solving in the laboratory is linked to a scientific approach, to: plan, manage and evaluate the implementation of the science laboratory for which they are responsible Able to make appropriate decisions based on analysis of information and data and communicate to the public in accordance with applicable regulations Responsible for the work carried out as a form of self-learning and being able to provide reports on work results related to activities in the science laboratory	observational data through presentations. Can answer audience questions related to the data presented	2.Rubric 3.4 4.The presentation was carried out coherently with appropriate intonation and emphasis, assisted by ppt media according to media criteria, the answer from the questioner was correct, formulating suggestions for improvement 5.3 6.The presentation was carried out coherently with intonation and but did not emphasize the important aspects of the research, with the help of ppt media according to media criteria, the answers from the questioner were generally correct, formulating suggestions for improvement 7.2 8.The presentation was carried out, was not coherent and/or did not emphasize important aspects of the research, was assisted by ppt media but did not meet the media criteria, the answers from the questioner were generally incorrect, formulated suggestions for improvement 9.1 10.The presentation was carried out, but was not coherent and/or did not emphasize important aspects of the research, was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was not assisted by ppt media, the answer from the questioner was incorrect, unable to formulate suggestions for improvement	learning approach (student-centered learning) Deductive learning method Strategy Lectures, discussions, presentations 3 X 50		application of lab management in schools Reference: Bettelheim & Landesberg.2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teachers.	0%
----	---	---	--	--	--	--	----

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	10%
2.	Portfolio Assessment	5%
		15%

Notes

- Learning Outcomes of Study Program Graduates (PLO Study Program) are the abilities possessed by each Study
 Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their
 study program obtained through the learning process.
- The PLO imposed on courses are several learning outcomes of study program graduates (CPL-Study Program) which are
 used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
- 3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
- 4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
- 5. **Indicators for assessing** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities or performance of student learning outcomes accompanied by evidence.
- Assessment Criteria are benchmarks used as a measure or measure of learning achievement in assessments based on
 predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased.
 Criteria can be quantitative or qualitative.
- 7. Forms of assessment: test and non-test.
- 8. Forms of learning: Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
- 9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
- Learning materials are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- 11. The assessment weight is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
- 12. TM=Face to face, PT=Structured assignments, BM=Independent study.