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

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Laboratory Work Management and Safety	8420103161		T=3	P=0	ECTS=4.77	3	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Prof. Dr. Erman, M.Pd.

Learning model	**Project Based Learning**
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**
	Program Objectives (PO)
	PLO-PO Matrix

	P.O

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Short Course Description	This course discusses laboratory management and administration, work planning and costs, laboratory work safety and security, making solutions, assessing laboratory work, and preparing SOPs.
References	**Main :**

1. Bettelheim & Landesberg.2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teacher.
2. Sri Hidayati S. 2001. Penyediaan Alat dan Bahan Praktikum.Makalah Pelatihan Teknisi Laboratorium Kimia/Biologi Madrasah Aliah se-JawaTimur di Madiun.
3. Supriono, Sri Hidayati dan Isnawati. 2011. Pelatihan atau Pembinaan Laboran Sekolah Jatim. Handout, tidak diterbitkan.

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.

Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)
		Indicator	Criteria & Form	Offline (*offline*)	Online (*online*)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

1	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. Explain the meaning of laboratory 2. Get to know laboratory equipment and its functions 3. Explain types of laboratories 4. Explain laboratory functions in relation to laboratory types	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement **Form of Assessment** : Participatory Activities	1. Student-centered learning approach (student-centered learning) 2. Deductive learning method 3. Strategy Lectures, discussions, presentations 6 X 50		**Material:** Lab Functions **Reader:** *Sri Hidayati S. 2001. Provision of Practical Tools and Materials. Training Paper for Chemistry/Biology Laboratory Technicians at Madrasah Aliah throughout East Java in Madiun.*	5%

2	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. Explain the meaning of laboratory 2. Get to know laboratory equipment and its functions 3. Explain types of laboratories 4. Explain laboratory functions in relation to laboratory types	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement **Form of Assessment** : Portfolio Assessment	1. Student-centered learning approach (student-centered learning) 2. Deductive learning method 3. Strategy Lectures, discussions, presentations 6 X 50		**Material:** Definition and types of Lab **Library:** *Supriono, Sri Hidayati and Isnawati. 2011. Training or Development of East Java School Laboratory Assistants. Handout, unpublished.*	5%

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%

4	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.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 answer from the questioner was incorrect, unable to formulate suggestions for improvement	Student-centered learning approach (student-centered learning) Deductive learning method Strategy Lectures, discussions, presentations 3 X 50		**Material:** How to use lab equipment **Reference:** *Bettelheim & Landesberg.2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teachers.*	5%

5	Can master theoretical concepts (Facts, Concepts, 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	1. Can assess laboratory function from a cognitive, psychomotor and affective perspective 2. Write a report of observation results to the laboratory	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement	Student-centered learning approach (student-centered learning) Deductive learning method Strategy Lectures, discussions, presentations 3 X 50		**Material:** Lab management **Library:** *Bettelheim & Landesberg.2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teachers.*	10%

6	Can master theoretical concepts (Facts, Concepts, 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	1. Can assess laboratory function from a cognitive, psychomotor and affective perspective 2. Write a report of observation results to the laboratory	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement **Form of Assessment** : Participatory Activities		Student-centered learning approach (student-centered learning) Deductive learning method Strategy Lectures, discussions, presentations 3 X 50	**Material:** Lab management **Library:** *Bettelheim & Landesberg.2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teachers.*	5%

7	Can master theoretical concepts (Facts, Concepts, 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	1. Can assess laboratory function from a cognitive, psychomotor and affective perspective 2. Write a report of observation results to the laboratory	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement		Student-centered learning approach (student-centered learning) Deductive learning method Strategy Lectures, discussions, presentations 3 X 50	**Material:** Lab managerial function **Reference:** *Bettelheim & Landesberg.2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teachers.*	5%

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%

9	Utilize science and 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	Explain laboratory management Make planning for procurement of tools and materials	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement		discussion, presentation 3 X 50	**Material:** Use of lab equipment **Reference:** *Sri Hidayati S. 2001. Provision of Practical Tools and Materials. Training Paper for Chemistry/Biology Laboratory Technicians at Madrasah Aliah throughout East Java in Madiun.*	10%

10	Utilize science and 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	Explain laboratory management Make planning for procurement of tools and materials	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement		discussion, presentation 3 X 50	**Material:** Use of lab equipment **Reference:** *Sri Hidayati S. 2001. Provision of Practical Tools and Materials. Training Paper for Chemistry/Biology Laboratory Technicians at Madrasah Aliah throughout East Java in Madiun.*	10%

11	Utilize science and 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	Explaining work 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	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement		Student-centered learning approach. Deductive learning method. Discussion strategy, presentation 3 X 50	**Material:** Making SOP **Readers:** *Supriono, Sri Hidayati and Isnawati. 2011. Training or Development of East Java School Laboratory Assistants. Handout, unpublished.*	10%

12	Utilize science and 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	Explaining work 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	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement		Student-centered learning approach. Deductive learning method. Discussion strategy, presentation 3 X 50	**Material:** Preparation of solutions **References:** *Supriono, Sri Hidayati and Isnawati. 2011. Training or Development of East Java School Laboratory Assistants. Handout, unpublished.*	5%

13	Utilize science and 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	Can communicate observational data through presentations. Can answer audience questions related to the data presented	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement		Student-centered learning approach (student-centered learning) Learning method is deductive, discussion, presentation 3 X 50	**Material:** Work safety practices **Reference:** *Bettelheim & Landesberg.2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teachers.*	10%

14	Utilize science and 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	Can communicate observational data through presentations. Can answer audience questions related to the data presented	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement	Student-centered learning approach (student-centered learning) Deductive learning method Discussion strategy, presentation 3 X 50		**Material:** Observation and application of lab management in schools **Reference:** *Bettelheim & Landesberg.2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teachers.*	5%

15	Utilize science and 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	Can communicate observational data through presentations. Can answer audience questions related to the data presented	**Criteria:** 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 answer from the questioner was incorrect, unable to formulate suggestions for improvement	Student-centred learning approach (student-centered learning) Deductive learning method Strategy Lectures, discussions, presentations 3 X 50		**Material:** Observation and application of lab management in schools **Reference:** *Bettelheim & Landesberg.2000. Laboratory Experiments for General, Organics, and Biochemistry Laboratory Handbook for Teachers.*	10%
16				UAS 3x50'			0%

Evaluation Percentage Recap: Project Based Learning

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

Notes

1. **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.
2. **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.
6. **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.
10. **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.