

**PORTOFOLIO
STUDY OF SCIENCE I
ACADEMIC YEAR 2019/2020 ODD SEMESTER**



**Course Coordinator:
Prof. Dr. Hj. Rudiana Agustini, M.Pd.**

**MASTER PROGRAM OF SCIENCE EDUCATION
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
UNIVERSITAS NEGERI SURABAYA**

TABLE OF CONTENT

A.	LEARNING ACTIVITIES PLAN	3
	A.1. COURSE IDENTITY	5
	A.2. COURSE DESCRIPTION	5
	A.3. LESSON PLAN	6
	A.4. MAPPING OF LEARNING OUTCOMES – COURSE OUTCOMES	16
	A.4.1. The Expected Program Learning Outcomes (PLO) of Master Program of Science Education (MPSE)	11
	A4.2. The Education Program Objectives (PEOs) of Career Development	17
	A4.3. Mapping of Program Learning Outcomes (PLO) – Education Program Objectives (PEOs)	17
B.	COURSE ASSESSMENT	17
	B.1. ASESSMENT RUBRIC	17
	B.2. ASSESSMENT SYSTEM	17
C.	COURSE DEVELOPMENT	18
	C.1. ACADEMIC YEAR 2019/2020 RESULT	18
	C.2. PROBLEM ANALYSIS	18
	C.3. SOLUTIVE STRATEGY	18
D.	APPENDICS	19
	D.1. DOCUMENT OF COURSE ACTIVITY	19
	D.1.1. Lecture’s journal and student’s attendance form siakadu.uneca.ac.id	19
	D.1.2. Example recap of student attendance at Career Development courses	21
	D.2. SAMPLE OF STUDENT WORK	21
	D.2.1. Sample of Test Paper	21
	D.2.2. Sample of Student’s Work	23
	D.3. RECAPITULATION OF ASSESSMENT	25
	D.3.1. Validate Test Item	25
	D.3.2 Evaluation Results of Career Development	25
	D.3.3. Percentage of PLO achievements of Career Development at Academic 2019/2020	26

A. SEMESTER LEARNING ACTIYITY PLAN

A.1. COURSE IDETITY

Master Program of Science Education Module Handbook


Module Name :	<i>Kajian Sains I/</i> Study of Science I*)
Module level :	Master Program of Science Education
Course Code :	8410102206
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	2 nd /First Year
Module coordinator(s)	Prof. Dr. Hj. Rudiana Agustini, M.Pd.
Lecturer(s):	Prof. Dr. Hj. Rudiana Agustini, M.Pd.
Language:	Indonesian Language
Classification within the curriculum:	Compulsory/ Elective
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or CU*)
Workload :	2 x 50 minutes lectures, 2 x 90 minutes structured activity, 2 x 100 minutes individual activity, 14 weeks per semester, 112 total hours per semester ~ 4.48 ECTS**
Credit Point:	2 CU (4.48 ECTS)
Requirements:	
Learning goals/competencies:	<p>Knowledge (KNO-2)</p> <p>CLO-1 Mastering knowledge of energy source materials in life including biological systems, processes that generate and use energy (including photosynthesis), transport and conversion energy in biological systems and everyday life.</p> <p>CLO-2 Mastering knowledge of energy availability and needs, forming awareness and energy-saving attitudes through an interdisciplinary approach in the form of science learning design.</p> <p>CLO-3 Mastering research / study activities to solve energy availability problems using various sources of information, physical sciences, chemistry, biology, and relevant technology.</p> <p>Competency (COM-3)</p> <p>CLO-4 Designing and creating a conducive scientific learning environment to carry out active learning and reflecting to</p>

	determine its effectiveness																														
Content	This course examines the concept of energy and its role in everyday living systems including biological systems, forms of energy and their changes, photosynthesis (photosystem 1, photosystem 2, phosphorylation and fixation of carbon), energy conversion pathways (oxidation, glycolysis, Krebs cycle, and respiration chain).																														
Attribute Soft skill:	Scientific report, public speaking, and team work																														
Study/exam achievements:	<p>Students are considered to be competent and pass if at least get 70.</p> <p>Final score is calculated as follows: 20% Participation + 30% Assignment + 20% Middle Exam (UTS) + 30% Final Exam (UAS)</p> <p>Final index is defined as follow:</p> <table border="1" data-bbox="742 761 1369 1142"> <thead> <tr> <th>Index</th> <th>Converted Score</th> <th>Score Range</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>4.00</td> <td>$85 \leq A \leq 100$</td> </tr> <tr> <td>A-</td> <td>3.75</td> <td>$80 \leq A- < 85$</td> </tr> <tr> <td>B+</td> <td>3.50</td> <td>$75 \leq B+ < 80$</td> </tr> <tr> <td>B</td> <td>3.00</td> <td>$70 \leq B < 75$</td> </tr> <tr> <td>B-</td> <td>2.75</td> <td>$65 \leq B- < 70$</td> </tr> <tr> <td>C+</td> <td>2.50</td> <td>$60 \leq C+ < 65$</td> </tr> <tr> <td>C</td> <td>2.00</td> <td>$55 \leq C < 60$</td> </tr> <tr> <td>D</td> <td>1.00</td> <td>$40 \leq D < 55$</td> </tr> <tr> <td>E</td> <td>0.00</td> <td>$0 \leq E < 40$</td> </tr> </tbody> </table>	Index	Converted Score	Score Range	A	4.00	$85 \leq A \leq 100$	A-	3.75	$80 \leq A- < 85$	B+	3.50	$75 \leq B+ < 80$	B	3.00	$70 \leq B < 75$	B-	2.75	$65 \leq B- < 70$	C+	2.50	$60 \leq C+ < 65$	C	2.00	$55 \leq C < 60$	D	1.00	$40 \leq D < 55$	E	0.00	$0 \leq E < 40$
Index	Converted Score	Score Range																													
A	4.00	$85 \leq A \leq 100$																													
A-	3.75	$80 \leq A- < 85$																													
B+	3.50	$75 \leq B+ < 80$																													
B	3.00	$70 \leq B < 75$																													
B-	2.75	$65 \leq B- < 70$																													
C+	2.50	$60 \leq C+ < 65$																													
C	2.00	$55 \leq C < 60$																													
D	1.00	$40 \leq D < 55$																													
E	0.00	$0 \leq E < 40$																													
Learning Methods :	Case Method and Discussion																														
Form of Media:	<i>Power Point</i> slides, e-book file, and multimedia.																														
Literature (primary references):	<ol style="list-style-type: none"> 1. Appling, D.R., Anthony Cahill, S.J., Mathew, C.K. (2016). <i>Biochemistry: Concepts and Connections</i>. Pearson 2. Pattabhi, V. And Ghautam, N. (2002). <i>Biophysics</i>. NewDelhi, Kluwer Academic Publisher. 3. Waigh, T. (2007). <i>Applied Biophysics</i>. Willey 																														
Notes:	<p>*1 CU in learning process = three periods consist of: (a) scheduled instruction in a classroom (50 minutes); (b) structured activity (90 minutes); and (c) individual activity (100 minutes) according to according to Rector Decree of Universitas Negeri Surabaya No. 598/UN38/HK/AK/2020</p> <p>**1 CU = 2.24 ECTS according to Rector Decree of Universitas Negeri Surabaya No. 598/UN38/HK/AK/2020</p> <p>*Total ECTS = (total hours workload/ 60 min) / 25 hours</p> <p>Each ECTS is equals with 25 hours</p>																														
Last Amendment	5 January 2023																														

A.2. COURSE DESCRIPTION

This course examines the concept of energy and its role in everyday living systems including biological systems, forms of energy and their changes, photosynthesis (photosystem 1, photosystem 2, phosphorylation and fixation of carbon), energy conversion pathways (oxidation, glycolysis, Krebs cycle, and respiration chain).

A.3. LESSON PLAN

	Postgraduate-Surabaya State University of Science Education Study Program				Document Code
	LESSON PLAN				
Courses (MK)		MK code	Weight (credits)	Smtr/Academic Year	Compilation Date
IPA Study 1		8410102206	2	Even /2022-2023	
RPS Developer		Coordinator		Head of Study Program	
Prof. Dr. Hj. Rudiana Agustini, M.Pd.		Prof. Dr. Hj. Rudiana Agustini, M.Pd.		Dr. Eko Hariyono , M.Pd. _	
Learning Achievement (CP)	PLO- Study Program Charged To Course				
	PLO-2	Develop knowledge and technology in the fields of physics, chemistry, biology and natural sciences supported by the latest IT.			
	PLO-9	Design a conducive science learning environment to carry out active learning activities and reflect on their effectiveness.			
	Course Learning Outcomes (CLO)				
	CLO1	Mastering knowledge of energy source materials in life including biological systems, processes that generate and use energy (including photosynthesis), transport and conversion energy in biological systems and everyday life.			
	CLO2	Mastering knowledge of energy availability and needs, forming awareness and energy-saving attitudes through an interdisciplinary approach in the form of science learning design.			
	CLO3	Mastering research / study activities to solve energy availability problems using various sources of information, physical sciences, chemistry, biology, and relevant technology			
	CLO-4	Designing and creating a conducive scientific learning environment to carry out active learning and reflecting to determine its effectiveness			
	Final ability of each learning stage (Sub-CLO)				
	Sub-CLO1	Communicating concepts related to the characteristics of living things, developing these concepts and using these concepts to explain events in everyday life.			
	Sub-CLO2	Present concepts related to ecosystems, develop these concepts and use the concepts to explain events in everyday life			
Sub-CLO3	Communicating concepts related to survival, developing these concepts and using the concepts to explain events in everyday life				

	Sub-CLO4	Communicating concepts related to the structure and function of plant organs, developing these concepts and using the concepts to explain events in everyday life
	Sub-CLO5	presenting right related concepts _ response plant , develop concepts tbs and use draft For explain incident in life everyday .
	Sub-CLO6	Communicate concepts related to photosynthesis, develop these concepts and use the concepts to describe events in everyday life.
	Sub-CLO7	Communicating concepts related to locomotion, developing these concepts and using the concepts to explain events in everyday life.
	Sub-CLO8	Communicate concepts related to the digestive system, develop these concepts and use the concepts to explain events in everyday life
	Sub-CLO9	Communicate concepts related to the respiratory system, develop these concepts and use the concepts to explain events in everyday life.
	Sub-CLO10	Communicating concepts related to the circulatory system, developing these concepts and using the concepts to explain events in everyday life
	Sub-CLO11	Communicating right related concepts _ system excretion
	Sub-CLO12	Communicating the nervous system to humans, developing these concepts and using the concepts to explain events in everyday life
	Sub-CLO13	Communicating concepts related to the reproductive system, developing these concepts and using them to explain events in everyday life
	Sub-CLO14	Communicate concepts related to inheritance, develop these concepts and use them to explain and present events in everyday life
	Sub-CLO15	Communicating concepts related to biotechnology, developing these concepts and using the concepts to explain events in everyday life
Description MK	This course examines the concept of energy and its role in everyday life systems including biological systems, forms of energy and their changes, photosynthesis (photosystem 1, photosystem 2, phosphorylation and carbon fixation), pathways of energy conversion (oxidation, glycolysis, cycle Krebs, and the respiratory chain).	
Study Materials/ Learning Materials	<ul style="list-style-type: none"> a. Characteristic features creature life b. Ecosystem c. Continuity life d. Structure and function of plant organs e. Response plant f. Photosynthesis g. Movement tools active and passive h. System digestion i. System breathing System circulation blood j. System excretion k. System nerves in humans 	

	1. System reproduction m. Heir characteristic n. Biotechnology
References	main :
	1. Appling, DR, Anthony Cahill, SJ, Mathew, CK (2016). <i>Biochemistry: Concepts and Connections</i> . Pearsons 2. Pattabhi , V. And Ghautam , N. (2002). <i>Biophysics</i> . NewDelhi , Kluwer Academic Publishers. 3. Waigh , T. (2007). <i>Applied Biophysics</i> . Willey
	Supporters :
	1. Articles _ relevant from journal reputable
Supporting Lecturer	Prof. Dr. Hj. Rudiana Agustini, M.Pd.
Prerequisite Courses	

Week-	Final ability each stage of learning (Sub-CLO)	Indicator	Assessment form	Learning Methods/Models (Estimated time)		Material Learning (References)	Rating Weight (%)
				offline (offline)	(online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Communicating related concepts characteristic features creatures live , develop draft it and use draft tbs and use draft For explain event in life daily	<ul style="list-style-type: none"> describe features _ creatures life identify error draft characteristic features creatures life Teach draft characteristic features creatures life from the resulting worksheets . 	Criteria : Test Written Shape : <u>Result of Presentation papers , papers , Final Exam (FE), Midterm Exam (ME)</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> Coordination lectures using WAGS Synchronou s via Zoom/ gmeet Material , information and tasks accessible _ _ through vinesa Time: 2 x 50 minutes 	Characteristic features creature life [1, 2, 3]	
2	presenting are related concepts ecosystem , develop concepts _ _ tbs and use draft For explain	<ul style="list-style-type: none"> Explain draft ecosystem identify error draft ecosystem 	Criteria : Test Written Shape :	Studies references , assignments ,	<ul style="list-style-type: none"> Coordination lectures using WAGS 	Ecosystem [1, 2, 3]	

Week-	Final ability each stage of learning (Sub-CLO)	Indicator	Assessment form	Learning Methods/Models (Estimated time)		Material Learning (References)	Rating Weight (%)
				offline (offline)	(online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	incident in life everyday _ _	<ul style="list-style-type: none"> Do practice influence factor abiotic of the resulting worksheets . 	<u>Result of Presentation papers , papers , papers, Final Exam (FE), Midterm Exam (ME)</u>	discussions and presentations	<ul style="list-style-type: none"> Synchronou s via Zoom/ gmeet Material , information and tasks accessible _ _ through vinesa Time: 2 x 50 minutes 		
3	Communicating right the best concepts hook continuity live , develop concepts tbs and use draft For explain incident in life daily	Compare ber like type adaptation . identify error draft continuity life Teach draft selection natural of the resulting worksheets	Criteria : Test Written Shape : <u>Result of Presentation papers , papers , papers, Final Exam (FE), Midterm Exam (ME)</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> Coordination lectures using WAGS Synchronou s via Zoom/ gmeet Material , information and tasks accessible _ _ through vinesa Time: 2 x 50 minutes 	Continuity life [1, 2, 3]	
4	communicate related concepts _ structure and function of plant organs , develop concepts tbs and use draft For explain incident in life daily	<ul style="list-style-type: none"> Explain connection structure and function of plant organs identify error draft plant structures and organs Observe structure roots , stems , leaves with use microscope	Criteria : Test Written Shape : <u>Result of Presentation papers , papers , papers, Final Exam (FE),</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> Coordination lectures using WAGS Synchronou s via Zoom/ gmeet Material , information and tasks accessible _ 	Structure and function of plant organs [1, 2, 3]	

Week-	Final ability each stage of learning (Sub-CLO)	Indicator	Assessment form	Learning Methods/Models (Estimated time)		Material Learning (References)	Rating Weight (%)
				offline (offline)	(online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			<u>Midterm Exam (ME)</u>		_ through vinesa • Time: 2 x 50 minutes		
5	presenting right related concepts _ response plant , develop concepts tbs and use draft For explain incident in life everyday .	<ul style="list-style-type: none"> • Explain and give example various type response plant • identify error draft response plant Determine type response plant from photos / pictures various response plant	Criteria : Test Written Shape : <u>Result of Presentation papers , papers , Final Exam (FE), Midterm Exam (ME)</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> • Coordination lectures using WAGS • Synchronou s via Zoom/ gmeet • Material , information and tasks accessible _ _ through vinesa • Time: 2 x 50 minutes 	Response plant [1, 2, 3]	
6	communicate related concepts _ photosynthesis develop concepts _ _ tbs and use draft For impressive incident in life everyday .	<ul style="list-style-type: none"> • Explain draft photosynthesis • identify to mistake draft photosynthesis Apply steps method scientific related test Engelman	Criteria : Test Written Shape : <u>Result of Presentation papers , papers , Final Exam (FE), Midterm Exam (ME)</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> • Coordination lectures using WAGS • Synchronou s via Zoom/ gmeet • Material , information and tasks accessible _ _ through vinesa • Time: 2 x 50 minutes 	Photosynthesis [1, 2, 3]	
7	communicate related concepts _ tool motion , develop concepts _ _ tbs and use draft For explain	<ul style="list-style-type: none"> • Compare tool motion active and passive 	Criteria : Test Written Shape :	Studies references , assignments ,	<ul style="list-style-type: none"> • Coordination lectures using WAGS 	Movement tool active and passive [1, 2, 3]	

Week-	Final ability each stage of learning (Sub-CLO)	Indicator	Assessment form	Learning Methods/Models (Estimated time)		Material Learning (References)	Rating Weight (%)
				offline (offline)	(online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	incident in life everyday .	<ul style="list-style-type: none"> identify to mistake draft tool motion , . Observe tool motion active and passive .	<u>Result of Presentation papers , papers , papers, Final Exam (FE), Midterm Exam (ME)</u>	discussions and presentations	<ul style="list-style-type: none"> Synchronou s via Zoom/ gmeet Material , information and tasks accessible _ _ through vinesa Time: 2 x 50 minutes 		
8	Mid Semester Exams						
9	Communicating right related concepts _ system digestion , develop concepts tbs and use draft For explain incident in life daily	<ul style="list-style-type: none"> Explain draft system digestion identify error draft system digestion Test content material food	Criteria : Test Written Shape : <u>Result of Presentation papers , papers , papers, Final Exam (FE), Midterm Exam (ME)</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> Coordination lectures using WAGS Synchronou s via Zoom/ gmeet Material , information and tasks accessible _ _ through vinesa Time: 2 x 50 minutes 	System digestion [1, 2, 3]	
10	<ul style="list-style-type: none"> communicate related concepts _ with system breathing , develop concepts tbs and use draft For explain incident in life everyday . 	<ul style="list-style-type: none"> Explain draft system breathing identify error draft system breathing Do practice lung volume capacity Compare system circulation blood big and small 	Criteria : Test Written Shape : <u>Result of Presentation papers , papers , papers, Final Exam (FE),</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> Coordination lectures using WAGS Synchronou s via Zoom/ gmeet Material , information and tasks accessible _ 	System breathing System circulation blood [1, 2, 3]	

Week-	Final ability each stage of learning (Sub-CLO)	Indicator	Assessment form	Learning Methods/Models (Estimated time)		Material Learning (References)	Rating Weight (%)
				offline (offline)	(online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<ul style="list-style-type: none"> communicate related concepts _ system circulation blood , develop concepts tbs and use draft For explain incident in life daily 	<ul style="list-style-type: none"> identify error draft system circulation blood Do simulation circulation blood big and small 	<u>Midterm Exam (ME)</u>		<ul style="list-style-type: none"> _ through vinesa Time: 2 x 50 minutes 		
11	Communicating right related concepts _ system excretion	<ul style="list-style-type: none"> Explain system excretion identify error draft system excretion Do practice system excretion of the resulting worksheets 	Criteria : Test Written Shape : <u>Result of Presentation papers , papers , Final Exam (FE), Midterm Exam (ME)</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> Coordination lectures using WAGS Synchronou s via Zoom/ gmeet Material , information and tasks accessible _ _ through vinesa Time: 2 x 50 minutes 	System excretion [1, 2, 3]	
12	communicate system nerves in humans , develop concepts _ _ tbs and use draft For explain incident in life daily	<ul style="list-style-type: none"> Explain system nerves in humans identify error draft system nerves in humans Do practice system nerves in humans of the resulting worksheets 	Criteria : Test Written Shape : <u>Result of Presentation papers , papers , Final Exam (FE), Midterm Exam (ME)</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> Coordination lectures using WAGS Synchronou s via Zoom/ gmeet Material , information and tasks accessible _ _ through vinesa Time: 2 x 50 minutes 	System nerves in humans [1, 2, 3]	

Week-	Final ability each stage of learning (Sub-CLO)	Indicator	Assessment form	Learning Methods/Models (Estimated time)		Material Learning (References)	Rating Weight (%)
				offline (offline)	(online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
13	communicate related concepts _ system reproduce , develop concepts tbs and use For explained right incident in life daily	<ul style="list-style-type: none"> a. Explain system reproduction b. identify error draft system reproduction c. Teach method care for the reproductive organs 	Criteria : Test Written Shape : <u>Result of Presentation papers , papers , Final Exam (FE), Midterm Exam (ME)</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> • Coordination lectures using WAGS • Synchronou s via Zoom/ gmeet • Material , information and tasks accessible _ _ through vinesa • Time: 2 x 50 minutes 	System reproduction [1, 2, 3]	
14	Communicating right related concepts _ inheritance properties, expand right concepts tbs and use For explain and present incident in life daily	<ul style="list-style-type: none"> • Explain term inheritance properties , Mendel's law I, II, means wrote genes, genotypes • identify error draft heir characteristic • Do practice cross monohybrid , dihybrid of the resulting worksheets 	Criteria : Test Written Shape : <u>Result of Presentation papers , papers , Final Exam (FE), Midterm Exam (ME)</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> • Coordination lectures using WAGS • Synchronou s via Zoom/ gmeet • Material , information and tasks accessible _ _ through vinesa • Time: 2 x 50 minutes 	Inheritance of Nature [1, 2, 3]	
15	communicate related concepts _ biotechnology , develop concepts _ _ tbs and use draft For explain incident in life daily	<ul style="list-style-type: none"> • Explain draft biotechnology • give example results biotechnology conventional and modern 	Criteria : Test Written Shape : <u>Result of Presentation papers , papers ,</u>	Studies references , assignments , discussions and presentations	<ul style="list-style-type: none"> • Coordination lectures using WAGS • Synchronou s via Zoom/ gmeet • Material , information 	Biotechnology [1, 2, 3]	

Week-	Final ability each stage of learning (Sub-CLO)	Indicator	Assessment form	Learning Methods/Models (Estimated time)		Material Learning (References)	Rating Weight (%)
				offline (offline)	(online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<ul style="list-style-type: none"> Do practice biotechnology conventional / visiting industry modern biotechnology , eg chorella 	papers, Final Exam (FE), Midterm Exam (ME)		and tasks accessible _ _ through vinesa <ul style="list-style-type: none"> Time: 2 x 50 minutes 		
16	Final Exam (FE)s						

Description :

- Learning Outcomes of Study Program Graduates (CPL-Prodi)** are abilities possessed by each Study Program graduate; is the internalization of attitudes, mastery of knowledge and skills (general and specific) in accordance with the study program level obtained through the learning process.
- CPL-Prodi imposed on MK** are several CPL-Prodi which underlie the formation/development of a course consisting of aspects of attitude, general skills, special skills, and knowledge.
- Course Learning Outcomes (CLO)** are abilities that are specifically described from the CPL-Prodi imposed on MK, which will be achieved after learning a particular course; specific to the study material or learning material for the course.
- Subject Sub-CP (Sub-CLO)** is a capability that is specifically described from CLO that can be measured or observed and is the final ability that is planned at each stage of learning; specific to the learning material of the course.
- Indicators** are markers for the achievement of Sub-CLO, in the form of specific and measurable statements that show the achievement of abilities, both in the process and in student learning outcomes.
- Forms of assessment** include assessment techniques, forms of instruments, and assessment criteria. Assessment techniques include observation, written tests, oral tests, and performance (*performance assessment*). Preference will be given to assessment through *performance assessment* based on real assignments that support the completion of a thesis/dissertation. The form of the assessment instrument and criteria is adjusted to the technique chosen by taking into account the principles of an educational, authentic, objective, accountable and transparent assessment .
- Learning method:** learning is carried out in a *hybrid-learning manner* , a mix of online and offline in a planned manner. Online learning is encouraged to utilize Vinesa (*virtual learning by Unesa*) and can be combined with other online learning *platforms* . Learning can be through expository, discussions, seminars, presentations, practicum, internships/field practice, assignments, and/or other equivalent forms of learning. Preference will be given to learning methods that activate students in solving real problems.
- Learning Model:** lectures are prioritized using problem solving learning models, either in the form of case -*method* , problem - *based learning* , and *project-based learning* . Each sequence of certain learning stages is included in the estimated time required.

9. **Learning Materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics. Also include literature that is relevant to the study material.
10. **The weight of the assessment** is the percentage of the assessment of each achievement of the sub-CLO which is proportional to the weight of the performance in achieving the sub-CLO; the total weight of the assessment is 100%.
11. **The final assessment weight formula** according to Unesa's academic guidelines:

$$\text{Final value} = \frac{2P + 3T + 2UTS + 3UAS}{10}$$


Note: P = participation; T = Task; UTS = Mid Semester Examination; and UAS = Final Semester Examination

12. **Midterm Exam (ME)** and **Final Exam (FE)** do not have to be in the form of a test. Can use other forms of assessment, for example presentations, writing papers, completing projects, and others, but must be submitted to students at the beginning of the semester and equipped with objective, accountable, and transparent assessment guidelines .
13. In order to realize **independent learning on an independent campus** in the Postgraduate environment, each Study Program can design lectures:
 - a. collaboration with similar study programs at other universities in the country to conduct guest lectures or joint lectures.
 - b. designing certain MKs is submitted using international languages, so that foreign students can participate and vice versa as a *credit earning/credit transfer program* .
 - c. cooperate with industry or other institutions oMidterm Exam (ME)ide the university in the form of internships, providing training, holding scientific forums, or other forms of collaboration to enrich the learning experience.

Activities 13 a, b, and c are carried out with due regard to the respective CPL-Prodi and CLO and are based on a clear cooperation agreement (MoA/ *Memorandum of Agreement* or IA/ *Implementation Arrangement*)

Telah Divalidasi

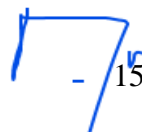
Unit Penjaminan Mutu Prodi S2 Pendidikan Sains.



Dr. Titin Sunarti, M.Si.

Mengetahui,

Ketua Prodi S2 Pendidikan Sains,



Dr. Eko Hariyono, S.Pd., M.Pd.

Surabaya, 15 Agustus 2022

Koordinator Mata Kuliah,

Prof. Dr. Hj. Rudiana Agustini, M.Pd.

A.4. MAPPING OF LEARNING OUTCOMES – COURSE OUTCOMES

A.4.1. The Expected Program Learning Outcomes (PLO) of Master Program of Science Education (MPSE)

ASPECTS	PLO	Kode
Knowledge	1. Mastering the philosophy of science education as a basis for thinking in developing superior innovations in the field of science education	KNO-1
	2. Mastering knowledge and technology in the fields of physics, chemistry, biology, and science, supported by the latest IT	KNO-2
	3. Mastering the theory of pedagogy and andragogy in the field of science education and able to package science learning through the TPACK (Technological, Pedagogical, and Content Knowledge) framework	KNO-3
Skill	4. Developing logical, critical, systematic, and creative thinking in the field of science through scientific studies and compiling scientific conceptions and studies based on scientific principles, procedures, and ethics in the form of a thesis.	SKI-1
	5. Able to solve science education problems with a multi and interdisciplinary approach, as well as documenting and communicating them through accredited national journals, international journals, or other media to the wider community through development research methodologies based on current issues	SKI-2
	6. Manage, develop, and maintain network to improve self-capacity in local, national, and international scope	SKI-3
Competency	7. Design, implement, and evaluate the science education curriculum to develop more effective learning innovations	COM-1
	8. Design and develop innovative learning materials (lesson plan, teaching materials, student work sheet, media, and/or assessment instruments) to solve learning problems and improve the quality of scientific learning	COM-2
	9. Designing and creating a conducive scientific learning environment to carry out active learning and reflecting to determine its effectiveness	COM-3
Attitude and Social	10. Have honest, independent, caring, tough, and leadership-minded attitude/character	SOC-1

ASPECTS	PLO	Kode
	11. Have the ability to develop themselves continuously	SOC-2

A4.2. The Education Program Objectives (PEOs) Of Study Of Study Science I

The Unesa Postgraduate Science Education Master Program aims to produce graduates who have the potential as academics, teachers, lecturers, educational consultants, researchers, and scientific developers who have the following characteristics:

PEO 1. Able to manage and develop science/science educational research programs to solve educational problems that develop in society through multi and interdisciplinary approaches.

PEO 2. Able to develop TPACK (Technology, Pedagogy, Content Knowledge)-based science learning materials, so that they get recognition at both national and international levels.

PEO 3. Able to build mutually beneficial cooperation networks in the field of science education in local, national, and international scope.

PEO 4. As an individual who has professional ethics and character (PEO-4)

PEO 5. Able to develop themselves continuously and sustainably through education, training, and/or other self-development activities both formal and informal (PEO-5)

A4.3. Mapping of Program Learning Outcomes (PLO) – Education Program Objectives (PEOs)

	PLO 2 (KNO-2)	PLO 9 (COM-3)
PEO 1	√	
PEO 2	√	√
PEO 3		√
PEO 4		
PEO 5	√	

B. COURSE ASSESSMENT

B.1. Assessment Rubric

Cognitive Criteria

1. The ability to give answers correctly
2. The ability to provide argumentation according to theory
3. The ability to provide systematic explanations
4. The ability to solve problems comprehensively

B.2. Assessment System

Final Assessment Course:

Group/Individuals Assignment	: 30%
Midterm examination	: 30%
Final Exam (FE)ination	: 40%

Distribution of the weight of the ability of the test item

	PLO 2 (KNO-2)	PLO 9 (COM-3)	Total
Group/Individuals Assignment	30%	70%	100%
Midterm examination	40%	60%	100%
Final Exam (FE)ination	40%	60%	100%

Success Criteria of Program Learning Outcomes (PLO)

Excellence	≥ 85
Good	≥ 70
Satisfy	≥ 55
Fail	> 0

Final index for undergraduate program defined as follow:

Index	Converted Score	Score Range
A	4.00	$85 \leq A \leq 100$
A-	3.75	$80 \leq A- < 85$
B+	3.50	$75 \leq B+ < 80$
B	3.00	$70 \leq B < 75$
B-	2.75	$65 \leq B- < 70$
C+	2.50	$60 \leq C+ < 65$
C	2.00	$55 \leq C < 60$
D	1.00	$40 \leq D < 55$
E	0.00	$0 \leq E < 40$

C. COURSE DEVELOPMENT

C.1. Academic Year 2019/2020 Odd Semester

Parameter	Σ of person	Percentage
Number or students taking this subject	39	100%
Number of students who pass at first attempt ($>C^+$)	39	100%
Number of students who pass at first attempt ($= C$)	0	0%
Number of failed students after remedial (D & E)	0	0%

C.2. Problems Analysis

In 2019/2020 academic year in The Study of Science I, there were 100% students had passed the examination at the first attempt. At the end of the Semester Examination there is not remedial test for students. Therefore, the improving learning strategies / methods were required to achieve the better results.

C.3. Soluteive Strategy

New teaching and learning methods should be developed for the next academic years, consisting of:

1. There needs to be a group study in understanding The Study of Science I, so that students teach each other, and peer tutors occur.
2. Enhance the cooperative skills of students with exchange the methods and models of learning

D. APPENDICES

D.1. DOCUMENT OF COURSE ACTIVITY

D.1.1. Lecture's journal and student's attendance form siakadu.uneca.ac.id for MPSE Class-2019

Pertemuan	Tanggal / Dosen	Topik	Status	BA PTMPT	Peserta PTMPT	Peserta	EDIT/SIMPAN	Peserta	Barcode
Ke 1	3 Februari, 2020 Dosen: TJANDRAKIRANA Anda sudah tidak dapat melakukan pengajuan perubahan pada pertemuan ini.	penjelasan RPS dan pembagian tugas	Ganti	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	15	Edit	Peserta	Barcode
Ke 2	10 Februari, 2020 Dosen: TJANDRAKIRANA Anda sudah tidak dapat melakukan pengajuan perubahan pada pertemuan ini.	Immunologi	Ganti	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	16	Edit	Peserta	Barcode
Ke 3	17 Februari, 2020 Dosen: TJANDRAKIRANA	1. Konsep energi 2. Macam energi Berdasarkan bentuk dan sumber 3. Perubahan energi	Terjadwal	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	18	Edit	Peserta	Barcode
Ke 4	24 Februari, 2020 Dosen: TJANDRAKIRANA	1. Manfaat energi dalam kehidupan sehari-hari	Terjadwal	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	18	Edit	Peserta	Barcode
Ke 5	2 Maret, 2020 Dosen: TJANDRAKIRANA	Presentasi dan diskusi mengenai fotosintesis	Terjadwal	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	17	Edit	Peserta	Barcode
Ke 6	9 Maret, 2020 Dosen: TJANDRAKIRANA	Presentasi dan diskusi energi pada proses Fotosintesis	Terjadwal	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	18	Edit	Peserta	Barcode
Ke 9	30 Maret, 2020 Dosen: RUDIANA AGUSTINI	Metabolisme lemak (anabolisme dan katabolisme lemak)	Terjadwal	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	18	Edit	Peserta	Barcode
Ke 10	6 April, 2020 Dosen: RUDIANA AGUSTINI	Permasalahan ketersediaan energi global maupaun nasional	Terjadwal	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	18	Edit	Peserta	Barcode
Ke 11	13 April, 2020 Dosen: RUDIANA AGUSTINI	Solusi terkait dengan permasalahan ketersediaan energi global maupaun nasional	Terjadwal	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	18	Edit	Peserta	Barcode
Ke 12	20 April, 2020 Dosen: RUDIANA AGUSTINI	Merancang pembelajaran terkait dengan penyediaan energi	Terjadwal	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	18	Edit	Peserta	Barcode
Ke 13	27 April, 2020 Dosen: RUDIANA AGUSTINI	Merancang pembelajaran terkait dengan penyediaan energi	Terjadwal	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	18	Edit	Peserta	Barcode
Ke 14	4 Mei, 2020 Dosen: RUDIANA AGUSTINI	Merancang pembelajaran terkait dengan penyediaan energi	Terjadwal	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	18	Edit	Peserta	Barcode
Ke 15	11 Mei, 2020 Dosen: RUDIANA AGUSTINI	Review	Terjadwal	Isi BA PTMPT Cetak BA PTMPT	Peserta PTMPT Cetak Peserta PTMPT	18	Edit	Peserta	Barcode



Aktivitas Perkuliahan

Nama Matakuliah : Kajian IPA 1

Dosen :

RUDIANA AGUSTINI (196008101990022001)
TJANDRAKIRANA ()

Kelas : 2019D

Jadwal & Ruang : X03.03.05 (10.20 - 12.00) R.

No.	Tanggal	Pertemuan	Topik	Peserta	Status	Dosen	Kesesuaian	Saran
1	03-02-2020	Pertemuan ke 1	penjelasan RPS dan pembagian tugas	15	Ganti	Tjandrakirana		
2	10-02-2020	Pertemuan ke 2	Immunologi	16	Ganti	Tjandrakirana		
3	17-02-2020	Pertemuan ke 3	1. Konsep energi 2. Macam energi Berdasarkan bentuk dan sumber 3. Perubahan energi	18	Terjadwal	Tjandrakirana		
4	24-02-2020	Pertemuan ke 4	1. Manfaat energi dalam kehidupan sehari-hari	18	Terjadwal	Tjandrakirana		
5	02-03-2020	Pertemuan ke 5	Presentasi dan diskusi mengenai fotosintesis	17	Terjadwal	Tjandrakirana		
6	09-03-2020	Pertemuan ke 6	Presentasi dan diskusi energi pada proses Fotosintesis	18	Terjadwal	Tjandrakirana		
7	16-03-2020	Pertemuan ke 7	1. Metabolisme karbohidrat	18	Terjadwal	Tjandrakirana		

D.1.2. Example recap of student attendance at Study of Science I for MPSE Class 2019



KEMENTERIAN PENDIDIKAN, KEBUDAYAAN,
RISET DAN TEKNOLOGI
UNIVERSITAS NEGERI SURABAYA

Jl. Lidah Wetan, Surabaya - 60213
Telepon : +6231-99424932
Faksimile : +6231-99424932
e-mail : bakpk@unesa.ac.id

PRESENSI KULIAH Periode 2019/2020 Genap

Mata Kuliah : Kajian IPA 1
Kelas : 2019D
Prodi : S2 Pendidikan Sains

Dosen : Prof. Dr. Hj. Rudiana Agustini, M.Pd.
TJANDRAKIRANA

No	NIM	Nama Mahasiswa	Pertemuan Ke															%
			1 03 Feb 20	2 10 Feb 20	3 17 Feb 20	4 24 Feb 20	5 02 Mar 20	6 09 Mar 20	7 16 Mar 20	8 23 Mar 20	9 30 Mar 20	10 06 Apr 20	11 13 Apr 20	12 20 Apr 20	13 27 Apr 20	14 04 May 20	15 11 May 20	
1.	18070795037	HANIFA RACHMAH KAMILA	H	H	H	H	I	H	H	H	H	H	H	H	H	H	H	100 %
2.	19070795002	MERCURY NIRWANA	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
3.	19070795014	CHOLIFATUR RIZKA	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
4.	19070795015	MASNA AWALIYAH	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
5.	19070795016	RADDINA APRILIA PUTRI	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
6.	19070795024	NURUL LATHIFATUL HAKIMAH	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
7.	19070795030	RISKI DWI FANANI	I	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
8.	19070795031	FARIDA ARIFAH	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
9.	19070795032	NURLITA CANDRA DEWI	I	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
10.	19070795035	IMAS NUR MAZIDAH	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
11.	19070795036	ANINDYA PRIMADAYUNING PUTRI	H	I	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
12.	19070795037	FERA LINDRA ISMAWANTI	I	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
13.	19070795039	DHANANG SETYO ERVANA	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
14.	19070795040	AISYAH JIYANTIKA GITADEWI	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
15.	19070795041	MULYONO	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
16.	19070795042	NISA AULIYAH	H	S	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
17.	19070795045	ANGGRAENI RUSMIA PUTRI	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
18.	19070795047	DESY SURYANI	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	100 %
Tanda Tangan Dosen / Asisten																		

D.2. SAMPLE OF STUDENT WORK

D.2.1. Sample of Test Paper

14. 2022/2023	EXAM MIDDLE SEMESTER ODD YEAR ACADEMIC
Course	: Study Of Science 1
Lecturer	: Dr. Yuni Sri Rahayu, M. Si. Dr. Sunu Kuntjoro, M.Sc. beni Setiawan, Ph.D.
Study Program/Class/Class	: Master Program Science Education

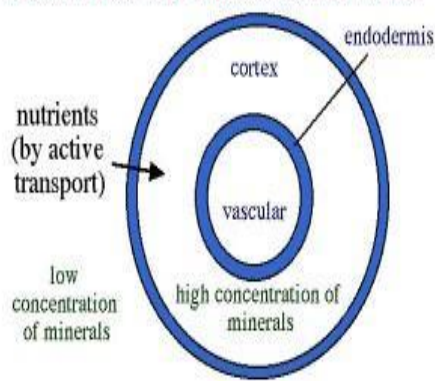
Instruction:

- a. pray before start read question And do UTS
- b. Moreover formerly, read it whole question in a manner careful.
- c. Do UTS This in a manner **Honest** with answer in a manner systematic And concise
- d. do it sheet answer in a manner separated For question A, B, And C

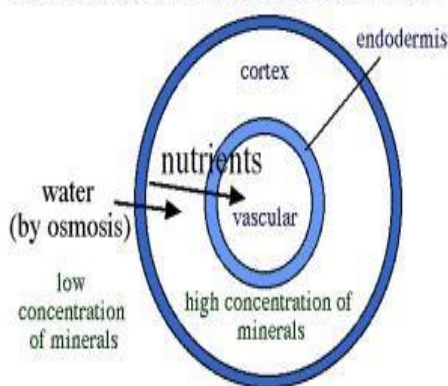
15. QUESTION A

Take note picture following!

How Plants Get Nutrients and Water



How Plants Get Nutrients and Water



1. Based on picture, analyze it things as following.
 - a. How mechanism transport ions mineral from outside body plant going to to plant body?
 - b. How mechanism transport water from outside body plant going to to body plant?
2. The process of transporting the results of photosynthesis has a mechanism known as theory phloem loading or the pressure flow hypothesis. Analyze what will happen with transport through the phloem if plant conditions in the following circumstances:
 - a. experience stress water.
 - b. experience stress high temperature.
 - c. How water mechanism and hara from xylem root to xylem leaf?
 - d. Define track Which skipped by mechanism short distance transport.
 - e. Define track Which skipped by mechanism long-distance transport.

- b. plants are in hot environmental conditions and strong winds, temporary water is in abundance.

D.2.2. Sample of Student's Work from MPSE Class-2019

1. Based on picture , analyze it things as following .

- a. How mechanism transport of mineral ions from outside body plant going to to body plants ?

Answer : Mineral ions from outside body plant enter into the body plant through the active transport process . Active transport process happen because it's at the root plant contain very high concentration of mineral ions . Condition This show that concentrate inside _ plant tall rather than concentrating within _ plant . There are differences concentration inside and outside _ body plant causes mineral ions to move enter into the body plant (happens transfer of mineral ions from concentration low going to concentration tall by active transport).

- b. How mechanism transport of water from outside body plant going to to body plants ?

Answer : The process of transporting water from outside body plant going to to in body Plants are preceded by an active transport process (the process of transporting mineral ions into the plant body plant). The influx of mineral ions from outside body plant going to to in body plant make the situation inside body plant thick . Condition concentrated showing that rate internal water potential body plant low . Whereas outside water potential body plant high . There are differences water potential outside and inside body plant result exists transport of water from outside body plant into the

body plant through the process of osmosis , namely movement of water from areas with water potential _ low going to potential area _ the water high . The process of transporting water and mineral salts from outside plant going to into the carried out by xylem vessels .

- c. How water and nutrient mechanisms of root xylem to the leaf xylem ?

Answer : Mechanism the arrival of water and nutrients from the root xylem going to to the leaf xylem Because exists Power capillarity leaf as well as exists ability adhesion and cohesion from wall cell plant . In part leaf there are stomata that have ability For open and close so that water vapor can go out enter into the plants . When water vapor comes out through the stomata resulting in the lower body the plant (stem) becomes empty . There is an event go out entry water vapor in the stomata causes exists different water potential in roots , stems and leaves plant . In part root more water potential low than on the stem As a result, water and nutrients will be lost enter into the stem . When on the stem low water potential and in parts leaf potential the water tall causes water by osmosis to reach the leaf xylem .

- d. Determine the path traversed by the short distance transport mechanism .

Answer : The short distance transport mechanism is transport mechanism through the membrane and completely influenced with concentration . The path that is from the root membrane going to part cortex root Transport mineral ions using active transport .

D.3. RECAPITULATION OF ASSESSMENT

D.3.1. Validate Test Item

The test for the end of semester evaluation consists of questions in the form of essays which have been analyzed by the lecturer in the Study of Science I. The essay question is validated by paying attention to several aspects, namely the suitability of the problem with indicators, language, content and construct

D.3.2. Evaluation Results of Study of Science I for MPSE Class 2018A

PROGRAM STUDI S2 Pendidikan Sains											
DAFTAR NILAI MAHASISWA											
Mata Kuliah : Kajian IPA 1											
Kelas : 2019D											
Tahun Ajaran : 2019/2020 Genap											
Keterangan :											
1. Komponen nilai yang diisi hanya : Part, Tugas, UTS dan UAS											
2. Nilai UAS mahasiswa dengan kehadiran dibawah 73.3% (kolom dg warna merah) tidak akan disimpan											
3. Jangan merubah apapun di dokumen ini kecuali pada point nomer satu di atas.											
4. PPTI / BAAK tidak menerima file nilai untuk diupload. Proses upload nilai dilakukan oleh dosen pengampu yang bersangkutan.											
No	NIM	Nama Mahasiswa	Angkatan	Kehadiran	Part	Tugas	UTS	UAS	NA	Huruf	Pakai
1	18070795037	HANIFA RACHMAH KAMILA	2018	100%	78	79	85	80	80.3	A-	1
2	19070795002	MERCURY NIRWANA	2019	100%	80	82	70	73	76.5	B+	1
3	19070795014	CHOLIFATUR RIZKA	2019	100%	78	74	80	73	75.7	B+	1
4	19070795015	MASNA AWALYAH	2019	100%	78	82	70	75	76.7	B+	1
5	19070795016	RADDINA APRILIA PUTRI	2019	100%	78	84	85	78	81.2	A-	1
6	19070795024	NURUL LATHIFATUL HAKIMAH	2019	100%	85	82	85	75	81.1	A-	1
7	19070795030	RISKI DWI FANANI	2019	100%	93	85	80	83	85	A	1
8	19070795031	FARIDA ARIFAH	2019	100%	75	84	90	83	83.1	A-	1
9	19070795032	NURLITA CANDRA DEWI	2019	100%	78	79	85	83	81.2	A-	1
10	19070795035	IMAS NUR MAZIDAH	2019	100%	73	74	70	80	74.8	B	1
11	19070795036	ANINDYA PRIMADAYUNING PUTRI	2019	100%	80	82	85	85	83.1	A-	1
12	19070795037	FERA LINDRA ISMAWANTI	2019	100%	83	79	70	80	78.3	B+	1
13	19070795039	DHANANG SETYO ERVANA	2019	100%	83	77	80	82	80.3	A-	1
14	19070795040	AISYAH JYANTIKA GITADEWI	2019	100%	75	79	70	70	73.7	B	1
15	19070795041	MULYONO	2019	100%	85	84	90	85	85.7	A	1
16	19070795042	NISA AULYAH	2019	100%	75	77	70	75	74.6	B	1
17	19070795045	ANGGRAENI RUSMIA PUTRI	2019	100%	80	79	80	83	80.6	A-	1
18	19070795047	DESY SURYANI	2019	100%	75	74	70	70	72.2	B	1

Original data :



D.3.3. Percentage of PLO achievements of Study of Science I at Academic Year 2019/2020 for MPSE Class 2019

PLO ASSESSMENT

Lecture : Kajian Sains IPA 1
 Code : 8410102206
 Department : S2 Pendidikan Sains
 Total of Student : 38

	PLO-3	PLO-10					
EXELENCE	16%	13%					
GOOD	84%	87%					
SATISFY	0%	0%					
FALSE	0%	0%					
	100%	100%					

