

Building D 3rd Floor FTTE UNS Jl Ir. Sutami No. 36 A Kentingan Surakarta 57126 Indonesia E-mail: biologi@fkip.uns.ac.id; Website: https://biologi.fkip.uns.ac.id/en/

Introduction to Sciencex and Mathematic Undergraduate Programme in Biology Education

Module Handbook

Module Name	Introduction to Sciences and Mathematics (Pengantar Sains					
	dan Mate	dan Matematika)				
Module level	Undergra	aduate F	Programme			
Course Code	0201324	2005				
Abbreviation, if applicable	-					
Courses included in the	-					
module, if applicable						
Semester/Term	2 nd					
Module coordinator (s)	Anif Jam	aluddir	ı, S.Si., M.Si. P	h.D.		
Lecturer (s)	Anif Jam	aluddir	ı, S.Si., M.Si. P	h.D.		
	Arum Nı	ır Wula	ndari, S.Pd., M	.Pd.		
Language	Bahasa I	ndonesi	a (Indonesian I	Language)		
Classification within the	Compuls	ory/ Ele	etive			
curriculum						
Teaching format/class hours			ion/face to face		rning: 22.67	
per week during the semester			discussion, wo ivity: 34 h/wee		a analyziz of	
			and learning me			
	1 2		nematics in pro			
	Self-study Activity: 34h/Week (Students learn					
	introduction to science and mathematic from various					
Workload	sources)					
Workload	Туре	CSU	Face to Face	Structured	Self-study	
	Type	CSU	race to race	Activities	Sch-study	
	T	2	22.67h	34h (1.12	34h (1.12	
			(0.75 ECTS)	ECTS)	ECTS)	
	Total	2	90.67h (3 EC	TS)		
			1 2 2 2 2 2 2 2 2			
Credit Points	2 CSU	(3 ECT	S)			
Requirements	-					
Learning goals/competencies	PLO 1	They	are able to d	lemonstrate th	neir fundamental	
		know	ledge in scienc	e and mathen	natics and relates	



Building D 3rd Floor FTTE UNS Jl Ir. Sutami No. 36 A Kentingan Surakarta 57126 Indonesia E-mail: biologi@fkip.uns.ac.id; Website: https://biologi.fkip.uns.ac.id/en/

	<u></u>				
	to problems in biology				
	PLO 7 They are able to solve problems and present the				
	idea argumentatively.				
	CLO 1 Apply mathematical principles and concepts in				
	understanding biological phenomena (e.g.				
	Fibonacci rules for understanding order in living				
	things) and solving biological problems				
	CLO 2 Apply descriptive statistical principles and				
	probabilities related to biology and its learning in problem-solving activities				
	CLO 3 Explaining the scope of science and interdisciplinary				
	science				
	CLO 4 Apply interdisciplinary principles of science in				
	problem solving				
	CLO/ P				
	PLO				
	1 2 3 4 5 6 7 8 9 10 CLO1 *				
	CLO2 *				
	CLO3 * * CLO4 * * * * * * * * * * * * * * * * * * *				
	CLOT				
Content	1. Types of diabetes, its causes and physiological				
Content					
	mechanisms, reviewing and analyzing literature (research				
	journals) about experimental animals in diabetes				
	research, communicating the results of analysis in written				
	(paper) and oral form (group presentation)				
	2. Types of experimental animals for diabetes research in				
	vivo, explaining induction techniques of diabetes				
	induction techniques in experimental animals, calculating				
	/determining inductance/diabetagen doses, understanding				
	the experimental animal markers, ethical clearance and				
	its preparation.				
	3. Hormone analysis techniques and protein expression both				
	in plasma, serum or organs of diabetic animals				
	4. organ structures (pancreas, ren, liver) which are heavily				
	influenced by diabetes conditions and are able to perform				
	problem-solving analysis related to diabetes and				
	problem-solving analysis related to diabetes and				



Building D 3rd Floor FTTE UNS Jl Ir. Sutami No. 36 A Kentingan Surakarta 57126 Indonesia E-mail: biologi@fkip.uns.ac.id; Website: https://biologi.fkip.uns.ac.id/en/

Attribute Soft skill	1. Able to think conceptually, analytical	ally, and logically			
	2. Have good communication skills				
	3. Able to solve problem and	present the idea			
Study/exam achievements	argumentatively Students are required to attend the face-to-face lecture minimum 75% to be able to take the Mid and Final exam. It is considered to complete the course and pass if students obtain at least 60% of maximum final score. The final score (FS) is calculated based on the following ratio:				
	Aspect	(%)			
	Task/quiz/presentation	30			
	Participation	10			
	Mid-Term Test	30			
	Final Exam	30			
	Final Score	100			
Form of Media	Powerpoint slide, article, specimen				
Literature (primary references)	 Sismondo, Sergio. (2007). An Introand Technology Studies. United Star Sons. Blomberg, Clas. (2007). Physics of Road to Biology. Amsterdam: Elsev. Cuyper, M.D and Bulte, Jeff W.M. (Chemistry Basis of Biotecnology. Academic Publishers. Douglas & Runger. (2003). App Probability for Engineers. United Statistika. Pramesti, Getut. (2014). Kupas Tudengan SPSS 22. Jakarta: Elex medi. Anwar, Ali. (2009). Statistika un Aplikasinya dengan SPSS dan Excel. Suwarjeni, V. Wiratna. (2008). Penelitian Mahasiswa dan Umum. Media. Arianto, Agus. (2004). Statistik Kon. 	tes: John Wiley and Life: The Physicst's ier (2002). Physics and Dordrecht: Kluwer lied Statistics and tates: John Wiley & Tarsito ntas Data Penelitian ia kumputindo ntuk Penelitian dan I. Kediri: IAIT Press Belajar SPSS untuk Yogyakarta: Ardana			



Building D 3rd Floor FTTE UNS JI Ir. Sutami No. 36 A Kentingan Surakarta 57126 Indonesia E-mail: biologi@fkip.uns.ac.id; Website: https://biologi.fkip.uns.ac.id/en/

dan Pengembangannya. Jakarta: Kencana Prenadamedia
Group
10. Sugiyono. (2013). Metode Penelitian Kuantitatif,
Kualitatif dan R & D. Bandung: Alfabeta

RUBRIC ASSESSMENT

Basic Assessment	Assessment	Indicators, Criteria	Valuation Weight	
	techniques	(taxonomy)	10%	
Task	Written Test	 Know the concept of science Understand history and science development Knowing interaction science in society 		
Case method, team based project	Participation, performances	1. Knowing the concept basic physics includes mechanic thermodynamic and electricity 2. Understand modern physics 3. Conducting analysis application of physics in the field biology	10%	
Case method, team based project	Participation, performances	1. Knowing interdisciplinary science 2. Understand and learn development of science across field 3. Conduct studies and present across disciplines of design from reputable journals	10%	
Team based project, Task	Performances	Students are able to Mastering the concept of science	10%	
Case method	Participation	Liveliness in the discussion and the quality of ideas	20%	



Building D 3rd Floor FTTE UNS Jl Ir. Sutami No. 36 A Kentingan Surakarta 57126 Indonesia E-mail: biologi@fkip.uns.ac.id; Website: https://biologi.fkip.uns.ac.id/en/

Case method	Participation	Liveliness in the	5%
		discussion and the quality	
		of ideas	
Case method	Participation	Liveliness in the	5%
		discussion and the quality	
		of ideas	
Team Based Project	Performances	Breaking up the problem	5%
		In biology with	
		Applying the concept	
		parametric/nonparametric	
		statistics	
Final Exam	Written Test	Accuracy, clarity, and	25%
		traceability of written test	
		answers	

MID TEST INTRODUCTION TO SCIENCE AND MATHEMATIC Tuesday, April 13 2021

Instruction:

- 1. Write the answer in the paper and write your name and ID Number
- 2. Copy this text below:
 - I declare that the following work is the result of my own thoughts and not from the results of cheating, because I believe in my own abilities.
- 3. Use clear stationery because the answer sheet will later be scanned
- 4. Make sure all questions are answered, thoroughly before collecting
- 5. Compile photos in 1 pdf file, making sure all answers are completed
- 6. Name file: Full Name Class A/B/C ID Number

Questions:

1. A massive spread of the disease caused by food, especially salmonella enteritidis content. An expert wanted to create descriptive statistics by taking a sample of 9 from an ice cream maker and the salmonella enteritidis content was calculated (in MPN/g). Data:

Calculate the average, Q1, and average deviations from the data! [Score 10]

2. A cross of a rat species produces a new sapling presented in the following table!

Color	Size					
	Small Medium Big					
White	11	5	7			
Gray	5	9	10			



Building D 3rd Floor FTTE UNS JI Ir. Sutami No. 36 A Kentingan Surakarta 57126 Indonesia E-mail: biologi@fkip.uns.ac.id; Website: https://biologi.fkip.uns.ac.id/en/

Black	8	6	9

From the results of the cross was taken 1 sample. What are the odds if:

- a. Picked up gray and medium mice
- b. Picked up black or small mice
- c. Picked up black mice if it is known that the size is small [score 10]
- 3. The 13 brands of cigarettes that were randomly selected and their nicotine levels measured in mg were as follows:

7.3	8.6	10.4	9.5	16.5	12.2
11.5	8.1	11.5	9.3	9.2	8.5
10.5					

With a significance level of 5%, test the hypothesis whether the average nicotine level in cigarettes exceeds 9, if it is known that the nicotine levels of cigarettes are distributed normally! [score 20]

4. In a biological experiment 3 concentrations of chemicals were used to stimulate the growth of a particular type of plant over a period of time. The following growth data, in centimeters, is recorded from living plants. Is there a noticeable difference in average growth caused by these three chemical concentrations? Use the significant level of 0.05. [score 20]

Concentration					
1	2	3			
6.5	5.5	6			
7	8	6.5			
6	6.5	5			
5.5	6	6			
8	7	7			
	4.5	5.5			

5. In the article Technometrics (Narula & JF Jellington in Montgomery 2003: 381) investigates the effect of taxes on the sale price of homes. With spss obtained the following output:



Building D 3rd Floor FTTE UNS JI Ir. Sutami No. 36 A Kentingan Surakarta 57126 Indonesia E-mail: biologi@fkip.uns.ac.id; Website: https://biologi.fkip.uns.ac.id/en/

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.569ª	.323	.248	2.4125

a. Predictors: (Constant), pajak

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.043	1	25.043	4.303	.068ª
1	Residual	52.383	9	5.820		
	Total	77.425	10			

a. Predictors: (Constant), pajak b. Dependent Variable: harga

Coefficients^a

		Unstandardized Coefficients		Standardized Coefficients			Correlations		
Model	l	В	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part
1	(Constant)	18.519	5.457		3.394	.008			
	pajak	2.144	1.034	.569	2.074	.068	.569	.569	.569

a. Dependent Variable: harga

With the output as above do a complete regression analysis!

Use $\alpha=5\%$ [score 20]

6. Students of the P. Biology study program want to assess the performance of the chairman of the association as long as the chairman of the association is still serving as the chairman of the association in the study program. Samples were taken as many as 20 students to assess before and after the election of the chairman of the association. The data used is in the form of a nominal scale, namely: like it or not. Here are the results of a survey of 20 students. Investigate with $\alpha = 5\%$, whether there is a difference in judgment before and after the election of the chairman set? [score 20]

Assessor name	Before election	After election
Aini	Like	Not like
Udin	Like	Not like
Zuhra	Like	Not like
Rudi	Not like	Like
Susi	Like	Like
Vera	Like	Like
Roby	Not like	Not like
Ihsan	Like	Like
Rival	Like	Like
Fitria	Like	Like



Building D 3rd Floor FTTE UNS JI Ir. Sutami No. 36 A Kentingan Surakarta 57126 Indonesia E-mail: biologi@fkip.uns.ac.id; Website: https://biologi.fkip.uns.ac.id/en/

Hengky	Like	Not like	
Husnul	Not like	Not like	
Idami	Not like	Like	
Putra	Like	Like	
Randy	Like	Like	
Rahmi	Not like	Not like	
Melani	Like	Not like	
Amelia	Not like	Not like	
Ocy	Not like	Like	
Fauzy	Like	Like	