WORKLOAD ASSESSMENT HYDROLOGY

GEOGRAPHY EDUCATION DEPARTMENT FACULTY OF SOCIAL SCIENCES AND LAW SURABAYA STATE UNIVERSITY

WORKLOAD ASSESSMENT

HYDROLOGY

Academic Year 2017/2018

Coordinator: Drs. Agus Sutedjo, M.Si

Team:

- 1. Drs. Agus Sutedjo, M.Si,
- 2. Drs. Bambang Hariyanto, M.Pd.

GEOGRAPHY EDUCATION DEPARTMENT FACULTY OF SOCIAL SCIENCES AND LAW UNIVERSITAS NEGERI SURABAYA

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HIDROLOGY						
Module/Course Title		Student Workload	Credits	Semester	Frequency	Duration
87202	202070	2 CU x 16 x 170'	2 CU 3.18 ECTS	3 TH SEMESTER	ONCE YEAR	1 SEMESTER
1	Types of	courses	Contact hours	Independent Study	Structured Study	Class size
	LECTURE	5	(2CU x 1,59 ECTS) x {(50:170') x 28,51 Workhours= 26,64	2CU x 1,59 ECTS) x {(60:170') x 28,51 Workhours= 31,96	2CU x 1,59 ECTS) x {(60:170') x 28,51 Workhours= 31,96	MAX 37 STUDENT
2	Prerequis	sites for par	ticipation (if ap	oplicable)		
	None					
3	Program	Learning of	utcomes			
	PLO 2					
	Able to an of resource support su	nalyze region ces and disas istainable de	nal and zoning of sters based on the velopment	characteristics (re the principles and	gionalization) l approach of	in the context Geography to
	PLO 6					
	Able to m geography and data	ake appropri y and geogra	ate decisions in phy education,	the context of sol based on the resul	ving problems ts of analysis of	in the field of of information
	PLO 8					
	Able to for physical a and resear	ormulate, pro and human as rch;	ocess, analyze c spects by using	lata, and present geospatial techno	geosphere info logy for geogr	ormation, both aphy learning
	PLO 11					
	Demonstra	te a responsib	le attitude toward	ds work in their are	a of expertise in	dependently
	 CLO 1. Able to analyze the characteristics of rainwater, evaporation, surface water and groundwater in an area to support sustainable development. (CPL-2) 					
	2. Ablet water	to solve probl r intrusion bas	ems of rain, flood sed on informatio	d and drought, grou on and data analysi	indwater level d s. (CPL-6)	lecline, and sea

HANDBOOK MODUL

	3. Able to process, analyze, and present data on rain, evaporation, river flow or groundwater quality using geospatial technology for research. (CPL-8)
	 Able to analyze the characteristics of rainwater, evaporation, surface water and groundwater in an area to support sustainable development. Able to be responsible for conducting hydrological cycle analysis independently (CPL-11)
4	Subject aims/Content
	1. The role of Hydrology in life
	2. Water Cycle
	3. Elements, classification, and calculation of the average Precipitation (rain) of the region
	4. Factors affecting evapotranspiration and calculating evapotranspiration
	5. Factors affecting runoff, diversity of runoff, and runoff discharge
	6. Factors affecting Infiltration and the practical importance of infiltration
	7. Occurrence of groundwater, groundwater movement, various aquifers
	8. Relationship between groundwater and surface water and seawater intrusion
5	Teaching methods Project Base Learning
6	Assessment methods paper test
7	This module/course is used in the following study programme/s as well -
8	Responsibility for module/course COMPULSORY/elective*/
	 Asdak, C., 2014, Hidrologi dan Pengelolaan Daerah Aliran Sungai, Yogyakarta, Gadjah Mada University Press.
	2. Hadi Susanto, N. 2015, Aplikasi Hidrologi, Yogyakarta : Jogja Mediautama
	3. Kodoatie, R.J., 2012, <i>Tata Ruang Air Tanah</i> , Yogyakarta: Penerbit Andi
	4. койоаце, к. ј., 2013, <i>кекауаза аап ivianajemen Banjir Kota</i> , Yogyakarta: Penerbit Andi
	5. Seyhan, E., 2010, Dasar-dasar Hidrologi, Yogyakarta: Gadjah Mada University Press
	6. Soemarto, C.D., 2007, Hidrologi Teknik, Suabaya: Usaha Nasional

A. Lesson Plan and Course Assessment

		Universitas Negeri Surabaya Faculty of Social Science And Law					Document Cod e		
		Geography Education Department							
				Lesson	Plan				
CC	OURSE		Code	Cluster		Credits	Semester	Compilation Date	
Hic	Irology		8720202070	Depar	tment Of Geography	2	3	2017	
AUTHO	ORIZATION		Lesson Plan Develo	oper	Coordi	nator	Head of S	Study Program	
			Drs. Agus sutedjo, I	M.Si.	Drs. Agus Sut	tedjo, M.Si.	Dra. Ita Maro	1ardiani Zain, M.Kes.	
Learning			Plo						
Outcome (PLO)	PLO 2	Able to an	alyze regional and region	onal chara	acteristics (regionaliza	tion) in the context	of resources and	d disasters based on	
Program		geographic	cal principles and approa	iches to s	upport sustainable dev	velopment			
	PLO 6	Able to ma based on t	ke appropriate decisions he results of information	s in the co and data	ontext of solving proble a analysis.	ems in the field of ge	eography and geo	graphy education,	
	PLO 8	Able to for	mulate, process, analyze	data, an	d present geosphere i	nformation both phy	/sical and human	aspects by using	
		geospatial	technology for geograph	ny learnin	g and research;				
	PLO 11	Demonstrat	te an attitude of responsib	ility for wo	ork in their field of exper	tise independently			
	Course Lea	rning Outcon	ne (CLO)						
	CLO 2 Able to analyze the characteristics of rainwater, evaporation, surface water and groundwater in an area to support sustainable development. (PL O-2)						ort sustainable		
	CLO 6	Able to solv	e the problems of rain, floo	ods and dr	oughts, decreased groui	ndwater levels, and se	awater intrusion ba	ased on information	
		and data an	alysis. (PL O-6)						
	CLO 8	Able to proo research. (P	cess, analyze, and present (L O-8)	data on ra	in, evaporation, river flo	w or groundwater qua	ality using geospatia	al technology for	
	CLO 11	Able to be r	esponsible for carrying out	hydrolog	ical cycle analysis indepe	endently (PL O-11)			

Course Description	This course discusses the formation of the elements of the water cycle, further discussion to understand students includes the kinds and factors that affect the magnitude of evapotranspiration, analysis and calculations about precipitation, and evapotranspiration in an area. About runoff or surface flows discuss the diversity of the territory, the calculation of river discharge and the factors affecting runoff. Another element, namely infiltration, is only limited to the factors affecting infiltration and the practical importance of infiltration from several aspects. The understanding of groundwater includes the presence of groundwater and various aquifers related to the properties of rock layers, groundwater movements, their relationship with surface water, and seawater intrusion. It is also studied about the role of hydrology in human life and the use of Information technology (IT) in its learning will increase the understanding of the material studied. Achievelearning competencies by using a <i>project base learning</i> approach with the				
Learning Materials/	1. The Role of Hydrol	ogy in life			
Topics	2. Water Cycle				
	3. Elements, classifica	tion and calculation of the average precipitation (rain) of the territory			
	4. Factors affecting Ev	vapotranspiration and calculating evapotranspiration			
	5. Factors affecting R	unoff, the diversity of coverage, and the discharge of runoff			
	6. Factors affecting in	fltration and the practical importance of infiltration			
	7. The occurrence of	occurrence of groundwater, groundwater movements, axle various aquifers			
	The relationship between g	groundwater and surface water and seawater intrusion			
References	Primary	7. Asdak, C., 2014, Hydrology and Watershed Management, Yogyakarta, Gadjah Mada University Press.			
		8. Hadi Susanto, N. 2015, Hydrological Applications, Yogyakarta : Jogja Mediautama			
		9. Kodoatie, R.J., 2012, Groundwater Spatial Planning, Yogyakarta: Andi Publishers			
		10. Kodoatie, R. J., 2013, Urban Flood Engineering and Management, Yogyakarta: Andi Publishers			
		11. Seyhan, E., 2010, Basics of Hydrology, Yogyakarta: Gadjah Mada University Press			
		12. Soemarto, C.D., 2007, Hydrology Engineering, Suabaya: National Enterprises			
	Supplementary	1. Gabler, R.E., Sack, D., Petersen, J.F., 2012, <i>Physical Geography</i> 10 th Edition, Brooks/Cole, Cengage Learning			
		2. Petersen, J.F., Sack, D., Gabler, R.E., 2012, Physical Geography 10th Edition, Canada, Brooks/Cole, Cengage Learning			
		3. Mulyaningsin, S., 2010, Introduction to Environmental Geology, Yogyakarta: A Guide			
Lecturer(s)	1. Drs. Agyus Sutedjo,	M. Si			
	2. Drs. Bambang Hariy	anto, M.Pd			
Prerequisites	General Geology				

Week	Learning Objectives	Assessment		Learning Activ and Time Allot	ities ment	Learning Sources	Scoring
		Indicators	Criteria/Form/ Type	Offline	Onl ine		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Able to analyze the hydrological cycle and the role of each cyclical element in life.	 1.1. Explaining the meaning of Hydrology. 1.2. Analyzing the Hydrological Cyclei 1.3. Analyzing the role of each element of Hydrology in Life 	Criteria : Performance rubric Form : 1. Non test Assessment of the analysis of the elements of the water cycle in relation to human needs 2. Quiz 1	Direct Instruction [TM : 1 (2x50')] Small Group Dscussion Task 1 Make an analysis of each element of the hydrological cycle in relation to human needs. [PT+BM : (1+1) x (2X60')]		Book: - Book 1 - Book 2 - Book 5 - Book 6	8
2	Able to analyze the magnitude of rain elements based on automatic rain data (rain graph on fluviogram)	 2.1. Explaining the classification of rain . 2.2. Analyze and calculate the magnitude of rain elements on the rain chart (fluviogram) 	Criteria : Performance Rubric Form : 1. Non Test Assessment Analysis of rain elements and their calculations 2. Quiz 2	Direct Instruction [TM : 1 (2x50')] Small Discution Task 2 Mmake analysis and calculation of rain elements [PT+BM : (1+1) x (2X60')]		Book: - Book 1 - Book 2 - Book 5 - Book 6	8

3	Able to calculate the average rainfall of the region based on rain data at at least 5 rain stations	 3.1. Explaining the diversity of rainrooms 3.2. Calculating the region's rainy average arithmetically 3.3. Calculating the average rain of the region with the Thiessen Polygon 3.4. Calculating the Average rainy region with Isohyet 	Criteria : Performance Rubric Form : 1. Non Test Assessment of the results of making rain maps 2. Quizzes	Direct Instruction [TM : 1 (2x50')] Project Based Learning Task 3 Creating a rain map by the method of thiessen and Isohyet polygons [PT+BM : (1+1) x (2X60')]	Book: - Book 1 - Book 2 - Book 5 - Book 6	8
4-5	Able to analyze the factors affecting evapotranspiration that occurs in a certain period of time with empirical formulas.	 4.1 Explaining the Meaning of Evapotranspiration 4.2. Animating factors affecting evapotranspiration. 4.3. Calculating daily evapotranspiration by modification method 4.4 Calculating Monthly Evapotranspiration by thornthwaite-matter method 4.5. Calculating 10 daily Evapotranspiration by the Turc method 	Criteria : Performance Rubric Form : 1. Non Test Assessment of the results of evapotranspiration calculations by the methods of Penmann i, Thorntwaite , and Turc 2. Quiz 4	Direct Instructioni [TM : 2 (2x50')] Small Group dscution Task 4 Calculating Evapotranspiration by using the Penmann, Thornthwaite, and Turc methods in an area. [PT+BM : (2+2) x (2X60')]	Book - Book 1 - Book 2 - Book 6	16
6	Able to analyze runoff factors and calculate the magnitude of runoff in a river	 5.1 Explaining the meaning of runoff 5.2 Analyzing the factors affecting runoff 5.3 Explaining the diversity of runoff 5. 4 Calculating river discharge by Manning method 	Criteria : Performance Rubric Form : 1. Non Test Assessment of the results of the calculation of sungal discharge	Direct Instruction [TM : 1 (2x50')] Small Discution Task 5 Calculating the discharge of sungal flow based on data [PT+BM : (1+1) x (2X60')	Book - Book 4 - Book 5 - Book 6	8

			2. Quiz 5			
7	Manpu assesses runoff in an area using empirical formulas	 6.1 Assessing runoff by rational formulas 6.2 Assessing runoff by the Melchior method 6.3 Assessing runoff with the Weduwen method 	Criteria : Performance Rubric Form : 1. Non Test Assessment of the results of the calculation of runoff by 3 methods. 2. Kuis 6	Direct Instruction [TM : 1 (2x50')] Problem Based Learning Task 6 Analyzing the causes of flooding in an area based on coefis-ien runoff [PT+BM : (1+1) x (2X60')	Book: - Book 1 - Book 2 - Book 5 - Book 6	8
9	Mampu analyzes the character of infiltration for practical purposes.	 7.1. Explaining the Concept of Infiltration 7.2. Analyzing the factors affecting infiltration 7. 3. Analyzing the character of infiltration for practical purposes 	Criteria Performance Rubric Form : 1. Non test Assessment of the results of the infiltration character analysis for practical purposes 2. Kuis 7	Direct Instruction [TM : 2 (2x50')] Small Group Discution Task 7 Analyzing the character of infiltration for practical purposes [PT+BM : (2+2) x (2X60')]	Book: - Book 5 - Book 3 - Book 4 - Book 6	8
10-11	Able toanalyze the occurrence of groundwater and groundwater movements in an area.	 8.1. Explaining the properties of rocks and the occurrence of groundwater 8.2. Analyzing the direction of movement of groundwater using cartographic methods 	Criteria : Performance Rubric Form : 1. Non Test Assessment of the results of making the direction of groundwater flow 2. Quiz 8	Direct Instruction [TM : 2 (2x50')] Small Group Discution Task 8 Creating the direction of groundwater flow in the groundwater forecast [PT+BM : (2+2) x (2X60')]	Book: - Book 3 - Book 4 - Book 5 - Book 6	12

12-13	Able todetermine the types of aquifers in an area	9.1. Explaining the meaning of the aquifer9.2. Determining the types of aquifers based on the character of the rock layers	Criteria : Performance Rubric Form : 1. Non Test Assessment of the results ofthe depiction of the distribution of various aquifers 2. Quiz 9	Direct Instruction [TM : 1 (2x50')] Small Group Discusion Task 9 - Drawing the distribution of various aquifers in thecharacter of the rock layer PT+BM : (2+2) x (2X60')]	Book: - Book 3 - Book 5 - Book 6	12
14-15	Able toanalyze the relationship between groundwater and surface water and seawater	10.1. Analyzing the relationship between groundwater and surface water10.2. Calculating the magnitude of seawater intrusion into the ground	Criteria : Rubric Kinerja Form : 1. Non Test Task assessment calculates seawater intrusion into land 2. Quiz 10	Direct Instruction. [TM : 1 (2x50')] Small Group Discution Task 10 Calculating the depth of seawater intrusion into the mainland [PT+BM : (2+2) x (2x60')]	Book: - Book 6 - Book 5 - Book 3	12

B. Calculation of Student Workload

Credit Unit	ECTS	Meeting Hours	Structured	Independent
(CU)			Assignments	Study
2 CU	3.18	1400 minutes	1680 minutes	1680 minutes

APPENDICES

APPENDIX 1 ASSESSMENT RUBRIC

Course Assessment

A. Assessment Rubric

1) Attitudes/Affective Domains

In this domain, the evaluation of student participation in class includes communication skills, discipline and responsibility. The rubrics used are as follows:

Criteria	Score
Communicate effectively, appreciate others'	85 ≤ SA ≤ 100
opinions; always attend the class on time; always	
submit	
the assignment on time; and always participate in the	
completion of group assignment	
Communicate effectively, appreciate others' opinions;	70 ≤ SA < 85
80% of attendance; submit 90% of the assignment; and	
often participate in the completion of group assignment.	
Communicate ineffectively, appreciate others' opinions;	55 ≤ SA < 70
75% of attendance; submit the 70% of assignment on	
time; and participate in the completion of group	
assignment.	
Communicate ineffectively, do not appreciate	≤ SA < 55
others' opinions; rarely attend the class; rarely	
submit the assignment; and rarely participate in the	
completion of group assignment	

2) Knowledge/Cognitive Domain

The students' knowledge is assessed through assignments (individual and group) and tests (mid-term and End-term tests).

a. Assignment Rubric

The criteria of assignment according to Assignment Rubrics:

No	Aspects	Max. Score
1	Finding the financial data:	
	a. Data collected from reputable source, i.e.	
	(Excellent = 3, Good = 2, Fair = 1)	
		3
2	Calculate data	
	a. Choose the correct formula	
	(Excellent = 3, Good = 2, Fair = 1)	3
	Calculate data	
	b. Correct calculation and result	_
	(Excellent = 3, Good = 2, Fair = 1)	3
3	Description of the calculation result	
	Make a description about the calculated result and explain	
	the meaning of the calculation result	
	(Excellent = 3, Good = 2, Fair = 1)	3
4	Conclusion	
	Make a conclusion including a suggestion for a better	
	performance for the company according to the analysis	
	(Excellent = 3, Good = 2, Fair = 1)	3
5	Assignment result paper	
	a. Systematic report	2
	(Excellent = 3, Good = 2, Fair = 1)	3
	Assignment result paper	
	b. Language use	2
	(Excellent = 3, Good = 2, Fair = 1)	3

b) Tests (mid-term and End-term tests)

The criteria of mid-term and End-term tests in this course are:

- 1. The ability to give answers correctly according to the key and rubrics;
- 2. The ability to provide robust argumentation according to theory;
- 3. The ability to provide systematic explanations; and
- 4. The ability to apply the essential concepts in a particular situation comprehensively .

B. Universitas Negeri Surabaya Grading System

University students are considered to be competent and pass if at least get 40% of the maximum End-term grade. The Final-term grade (NA) is calculated based on the following weight:

Assessment Components	Percentage
Participation (including attitudes/affective)	20%
Assignment	30%
Mid-term test	20%
Final-term test	30%

Scoring Interval (out of 100)	Point	Grade
85 ≤ NA ≤ 100	4.00	A
80 ≤ NA < 85	3.75	A-
75 ≤ NA < 80	3.50	B+
70 ≤ NA < 75	3.00	В
65 ≤ NA < 70	2.75	B-
60 ≤ NA < 65	2.50	C+
55 ≤ NA < 60	2.00	C
40 ≤ NA < 55	1.00	D
0 ≤ NA < 40	0	E

Scoring Conversion

APPENDIX 2 COURSE ACTIVITIES RECORDS

a. Sample of Student Attendance

SIAKAD : Absen

https://siakadu.unesa.ac.id/5fd8bef5-0522-3d0e-92f7-2e0d5803ec07.as...



KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET DAN TEKNOLOGI UNIVERSITAS NEGERI SURABAYA Jl. Lidah Wetan, Surabaya - 60213 Telepon :+6231-99424932 Faksimile :+6231-99424932 e-mail :bakpkgunesa.ac.id

PRESENSI KULIAH Periode 2019/2020 Gasal

Mata Kuliah : Hidrologi

: 2018A

Kelas Prodi

: S1 Pendidikan Geografi

Dosen : Drs. Bambang Hariyanto, M.Pd. Drs. Agus Sutedjo, M.Si.

			Pertemuan Ke															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
No	NIM	Nama Mahasiswa	20	27	03	10	17	25	01	08	06	06	06	06	06	06		96
			Aug	Aug	Sep	Sep	Sep	Sep	Oct	Oct	Dec	Dec	Dec	Dec	Dec	Dec		
			19	19	19	19	19	19	19	19	19	19	19	19	19	19		
1.	18040274001	ARINDA NUFITASARI	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
2.	18040274002	RISKA KUSUMANINGTYAS	H	H	H	н	H	H	н	н	H	н	н	H	н	н		93.3 %
3.	18040274003	ANDREW DEVARA HARMAWAN	H	H	H	н	H	H	н	н	н	н	н	H	н	н		93.3 %
4.	18040274004	SITI SHOLIKHATUN NADHIROH	H	н	н	H	н	H	H	H	I	н	I	н	н	н		93.3 %
5.	18040274005	RAHMA NURIL PAHLEFI	H	н	H	н	н	H	н	н	H	н	н	н	н	н		93.3 %
6.	18040274006	ALFIANI SOFITRI	H	H	H	н	A	H	н	н	н	н	н	H	н	н		86.7 %
7.	18040274007	RAHMA DINA LAILATUS FAUZIAH	H	H	H	н	н	H	н	н	н	н	н	н	н	н		93.3 %
8.	18040274008	FIANSYAH YOGA MUKTI	A	A	H	A	A	Η	A	н	н	н	н	H	н	н		60 %
9.	18040274009	SARAH DYAH ARUM KUSUMADEWI	H	н	н	н	н	Η	н	н	н	Н	н	н	н	н		93.3 %
10.	18040274010	AMELIA WAHYU ENGGARWATI	H	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
11.	18040274011	DINDA FITRIANA PUTRI LESTARI	н	н	H	H	н	н	H	H	H	Η	H	н	Η	н		93.3 %
12.	18040274012	RIFDA IZZATUN NADA	H	Η	I	I	A	Ξ	I	Ŧ	H	H	Η	I	H	H		86.7 %
13.	18040274014	AYU LESTARI	Н	Н	Ξ	I	н	т	I	Ŧ	Н	Η	Н	H	Н	H		93.3 %
14.	18040274015	SESIRIA DWI MUSTIKASARI	H	Η	H	H	Н	Ξ	H	H	н	Н	Η	Η	Н	Η		93.3 %
15.	18040274016	AMIROH AULIA RISKA	H	Η	I	I	H	Ξ	I	Ŧ	H	H	Η	I	H	H		93.3 %
16.	18040274017	AMALIA UMAR	н	н	H	н	н	Ξ	H	Η	н	н	н	н	н	н		93.3 %
17.	18040274018	YUNITA ROHMATUL UMAH	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
18.	18040274019	RIZKA AINNAYA ALFFATIKA	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
19.	18040274020	FAHMIYAH WIRAYANTI	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
20.	18040274021	WAHYUNING DEWI	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
21.	18040274022	WIDAD DZAWIN NUHA	н	н	н	н	н	Η	н	н	н	н	н	н	н	н		93.3 %
22	18040274023	MUHAMAD BANGUN SETIYA	н	н	н	н	н	Η	н	н	н	н	н	н	н	н		93.3 %
23.	18040274024	UKHTI HAIFA RAHMADHANI	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
24.	18040274025	FATIMAH ZUHROTU JANNAH	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
25.	18040274027	GALUH AYU RETNO WULAN	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
26.	18040274028	NAZILAH CHOIRUNNISA	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
27.	18040274029	DENTAMERA KUSUMA	н	н	н	н	н	Ξ	н	н	н	н	н	н	н	н		93.3 %
28.	18040274030	TRISKA IVANE RAMADHANTI	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
29.	18040274031	INTAN VIDI PANGESTU	н	Η	H	н	н	т	н	H	н	Η	н	Η	н	н		93.3 %
30.	18040274032	APRELYA ARINDITA	н	н	H	н	н	Ξ	н	н	н	Η	н	н	н	н		93.3 %
31.	18040274033	RIZKI ANIFAH	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
32.	18040274034	ANISAH WULANDARI	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
33.	18040274035	RHOZI MUKHLISIN	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
34.	18040274036	MILLENIA RAHMA JAYANTI	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
35.	18040274037	NIA APRILLIA	H	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
36.	18040274038	ANANDA RIZQI HANIFAH	н	н	н	н	н	н	н	н	н	н	н	н	н	н		93.3 %
Tanda Tangan Dosen / Asisten																		

b. Sample of Course Log Book



Kelas

KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET, DAN TEKNOLOGI

UNIVERSITAS NEGERI SURABAYA

Kampus Ketintang Jalan Ketintang, Surabaya 60231 T: +6231-8293484 F: +6231-8293484 Iaman: unesa.ac.id email : bakpk@unesa.ac.id

Aktivitas Perkuliahan

Nama Matakuliah : Hidrologi

: 2017A

Dosen

BAMBANG HARIYANTO (196502041993021001) SOEGIYANTO (195403311988031001)

Jadwal & Ruang : 103.02.06 (13.00 - 14.40) R.

No.	Tanggal	Pertemuan	Topik	Peserta	Status	Dosen	
1	11-9-2018	Pertemuan ke 1	 Pengertian Hidrologi Siklus Hidrologi 	37	Terjadwal	Bambang Hariyanto	
2	18-9-2018	Pertemuan ke 2	 Klasifikasi Hujan Unsur-unsur hujan 	37	Terjadwal	Bambang Hariyanto	
3	25-9-2018	Pertemuan ke 3	 Keragaman Hujan Hujan rata-rata 	37	Terjadwal	Soegiyanto	
4	03-10-2018	Pertemuan ke 4	1. Pengertian Evapotranspirasi	37	Terjadwal	Soegiyanto	
			2. Faktor-faktor Evapotranspirasi				
5	10-10-2018	Pertemuan ke 5	1. Perhitungan Evapotranspirasi	37	Terjadwal	Soegiyanto	
6	17-10-2018	Pertemuan ke 6	1. Pengertian Limpasan	37	Terjadwal	Soegiyanto	
			2. Unsur-unsur limpasan				
7	24-10-2018	Pertemuan ke 7	1. Keragaman Limpasan	37	Terjadwal	Bambang Hariyanto	
8	31-10-2018	Pertemuan ke 8	Penaksiran Limpasan dengan metode rasional	37	Terjadwal	Bambang Hariyanto	

9	7-11-2018	Pertemuan	UTS	37	Terjadwal	Bambang Hariyanto			
		ke 9							
10	14-11-2018	Pertemuan ke 10	- Air Tanah - Faktor- faktor yang mempengaruhi keberadaan Air Tanah - Kepentingan praktis bagi manusia secara berkelanjutan	37	Terjadwal	Soegiyanto			
11	21-11-2018	Pertemuan ke 11	Kondisi Akifer	37	Terjadwal	Soegiyanto			
12	28-11-2018	Pertemuan ke 12	lanjutan Akifer	37	Terjadwal	Soegiyanto			
13	5-12-2018	Pertemuan ke 13	Membahas Intrusi Air Laut	37	Terjadwal	Soegiyanto			
14	12-12-2018	Pertemuan ke 14	Danau	37	Terjadwal	Soegiyanto			
15	19-12-2018	Pertemuan ke 15	Mereviu materi kuliah yang telah disampaikan	37	Terjadwal	Soegiyanto			
16	26-12-2018	Pertemuan ke 16	UAS	37	Terjadwal	Soegiyanto			

SIAKADU: Cetak Jurnal Perkuliahan

c. Sample of Assignment:

HYDROLOGICAL TASKS

Course : Hydrology

Class	: 2017 A. B, C
Year	: 2018
Lecturer	: 1. Dr. Sugiyanto. M.Si
	2. Drs. Bambang Haryanto, M.Pd

Task: 1. Look around your relatives' residences or other places that often experience flooding.

- 2. Analyze why the area often experiences flooding in terms of land use and topography aspects.
- To do this task, look for rain, land use, and topography data in the area you choose, both primary data and secondary data.
- Assignments are carried out in groups of up to 3 students, but each student still makes their own report.
- Task results are collected no later than 3 weeks after the task is assigned

d. Sample of Mid-term Test

SURABAYA STATE UNIVERSITY FACULTY OF SOCIAL SCIENCES AND LAW DEPARTMENT OF GEOGRAPHY EDUCATION 2018

Course: Hydrology Class : 2017 A, B, C Time : 10.00 – 11.40 (7 Nov 2018) Lecturer : Bambang Hariyanto

Question!

 If it is known that daily rainfall has a rain intensity (I) 100mm / day, Coefficient Run Off (C) 0.5 with an area of River Flow Area 24 km2. Calculate the magnitude of the Run Off that happened! If the Formula is as follows:

Q = C I A

m3/day (25 %)

- 2. In calculating the average rainfall can be done in different ways, according to what calculation method is the most thorough? Explain with rational argumentation brother! (25%)
- 3. Why is one DPS in hydrology used as the basis of the hydrological research unit unit? Explain! (25%)
- 4. Explain based on your understanding what is meant by groundwater and soil water? (25 %)

e. Sample of End-term Test

MINISTRY OF RESEARCH TECHNOLOGY AND HIGHER EDUCATION OF THE REPUBLIC OF INDONESIA DEPARTMENT OF FISH GEOGRAPHY EDUCATION , SURABAYA STATE UNIVERSITY FINAL SEMESTER EXAMS 2018 – 2019

Course: Hydrology Day/date : Rebo Legi /December 12, 2018 Time: 100 minutes Lecturer: Dr.Soegiyanto M,Si

Drs.Bambang Haryanto M.Pd

QUESTION

- 1. Tell the following sequences of the Hydrological Cycle with the picture
- 2. In an X region in the shape of a samakaki triangle with a peak angle of 30° distance AC = BC = 4.5 km there are 3 known rain stations:
 - a) Rainfall Station A monthly rainfall = 188 mm
 - b) Rainfall Station monthly rainfall B = 159 mm
 - c) Monthly rainfall of Rain station C = 96 m

Make the average rain of region X with the Arithmetic method

- 3. a). . What is called the Aquifer
 - b). How many types of Aquifers are there in terms of their location. give a picture of the sketch
 - c). What is referred to as; Aquifug and Aquiclude
 - d). Hanging aquifers/ perches
- 4. Below is a sketch image of the Seawater Intrusion



Question

- a. So-called Seawater Intrusion
- b. Whatis meant by Interface
- c. If it is known h_f = 43 m, what is the value of h_s ? what does the value of h_s mean
- 5. a). The occurrence of lakes there are 7 different, describe each of them

b). What is the function of the lake for human life.

Score

Question no. 1 weight = 15 Question no. 2 weight = 20 Question no. 3 weight = 30 Question no. 4 weight = 20 Question no. 5 weight = 15

f. Sample of of Student's Answer to Assignment, Mid-term, and End-term Test

HYDROLOGICAL TASKS

Below is the annual rain data at the rain station in Madukoro District. The location of each station can be seen on the polgon and isohyet maps..

- P1 = 485 mm
- P2 = 406 mm
- P3 = 397 mm
- P4 = 443 mm
- P5 = 394 mm
- P6 = 408 mm

Based on rain data in the region, calculate the average rainfall of the region by the Arithmetic, Polygon Thiessen, and Isohyet methods.

Note : The position of the rain Station for the 3 counts is fixed, Create a Thiessen polygon map and Isohyet map with the use of a scale of 1:250,000

ANSWER

1. Arithmetic **Methods** Known : Precipitation data : P1 = 485 mm -P2 = 406 mm P3 = 397 mm P4 = 443 mm P5 = 394 mm P6 =408 mm Number of precipitation stations = 6 -Asked: Average rainfall using the arithmetic method (= P average) P1+P2+P3+P4+P5+P6 number of stations 485+406+397+443+394+408 6

$$=\frac{2,533}{6}=422.17$$
 mm



2. Polygon Thiessen Method

Known :

- Precipitation data : P1 = 485 mm

P2 = 406 mm P3 = 397 mm P4 = 443 mm P5 = 394 mm P6 = 408 mm

- Area of influence : A1 = 43 x 6.25 = 268.75 ha

A2 = 22 x 6.25 = 137.5 ha A3 = 17 x 6.25 = 106.25 ha A4 = 26 x 6.25 = 162.5 ha A5 = 22 x 6.25 = 137.5 ha A6 = 22 x 6.25 = 137.5 ha

Asked : Average rainfall using the Polygon Thiessen method Answer:

$$P = \frac{P1. A1 + P2. A2 + P3. A3 + P4. A4 + P5. A5 + P6. A6 A1 + A2 + A3 + A4 + A5 + A6}{(485,268.75) + (406,137.5) + (397,106.25) + (443,162.5) + (394,137.5) + (408,137.5)}{268.75 + 137.5 + 106.25 + 162.5 + 137.5 + 137.5}$$
$$= \frac{410,612.5}{950} = 432.22 \text{ mm}$$

So, the average rainfall according to the Polygon Thiessen method is 432.22 mm

Isohyet method



Known :

- Rainfall data : $PO = \frac{10+11}{2} = \frac{380+400}{2} = \frac{390}{2} \text{ mm}$ • $P1 = \frac{11+12}{2} = \frac{400+420}{2} = 410 \text{ mm}$ 2 2 $P2 = \frac{12+13}{2} = \frac{420+440}{2}$ 430 mm P3 = $\frac{13+14}{2}$ = $\frac{440+460}{2}$ = 450 mm $P4 = \frac{14+15}{2} = \frac{460+480}{2} = 470 \text{ mm}$ 2 = ⁴⁸⁰⁺⁵⁰⁰ $P5 = \frac{15+16}{2}$ 490 mm 2 Area of Influence :A0 = 64 x 6.25 = 400 ha • A1 = 39 x 6.25 = 25 ha $A2 = 8 \times 6.25$ = 50 ha $A3 = 3 \times 6.25$ = 18.75 ha $A4 = 8 \times 6.25$ = 50 ha $A5 = 7 \times 6.25$ = 43.75 ha •
- Asked: Average rainfall using the Isohyet method

- Answer :

$$P = \frac{P0. A0 + P1. A1 + P2. A2 + P3. A3 + P4. A4 + P5. A5 A1 + A2 + A3 + A4 + A5 + A6}{(390 \times 400) + (410 \times 25) + (430 \times 50) + (450 \times 18.75) + (470 \times 50) + (490 \times 43.75)}$$
$$= \frac{241,125}{587,5} = 410.42 \text{ mm}$$

So, the average precipitation according to the Polygon Thiessen method is 410.42 mm

Determining the Iso<u>hyet point between two</u> stations curah rain

- Point 400 = $\frac{400-394}{406-394}$ cm = 3 cm above station 394
- Point 420 = $\frac{420-406 \text{ x}}{443-406}$ 4.5 cm = 2.27 cm above station 406
- Point $440 = \frac{440-406 \times 4.5}{443-406}$ cm = 4 cm above station 406
- Point 460 = $\frac{460-443 \times 3.5}{485-443}$ cm = 1.4 cm above station 443
- Point 480 = $\frac{480+443 \times 3.5}{485-443}$ cm = 3 cm above station 443

Point
$$480 = \frac{480+408 \times 5}{485-408}$$
 cm = 4.6 cm above station 408
Point $460 = \frac{460+408 \times 5}{485-408}$ cm = 3.3 cm above station 408
Point $440 = \frac{440+408 \times 5}{485-408}$ cm = 2 cm above station 408
 $485-408$
Point $420 = \frac{420+408}{485-408}$ x 5 cm = 0.7 cm above station 408
Point $400 = \frac{400+397 \times 6}{408-397}$ cm = 1 cm above station 397

Land Use

Based on land use data along with the value of C (flow efficiency) obtained at the Jombang Regency Agriculture Office, land use in Madukoro District is Housing n (area = %, C = 065), Industrial Areas (area = 5%, C = 0.75), Agricultural land (area = 65%, C = 0.30).

From this data, an average value of C can be obtained for Madukoro district, namely

C mean = = = 0.4275
$$\frac{30 \times 0.65 + 5 \times 0.75 + 65 \times 0.30}{30 + 5 + 65} \frac{19.5 + 3.8 + 19.5}{100}$$

Based on the magnitude of the C value, a small part of rainwater will become surface flow and most of it will enter the soil or undergo infiltration, so it is possible that there will be no flooding.

Topography

Based on the results of the analysis of the topographic map of Madukoro District, it is a flat area with a slope of less than 3°. Thus topographic factors affect the inundation that occurs. The flat topography will slow down surface flow resulting in inundation or flooding.

CONCLUSION

Based on data and the results of rain calculations, land use, topography, it can be estimated that the floods that occur in Madukoro District are influenced by topography, rainwater that flows on the surface is slow in flow or experiences flooding so that it looks like a flood.

Name : Fitriyana Febriyanti NIM : 17040274043 Class : 2017 B

g. Sample of of Student's Answer to Assignment, Mid-term, and Final-term Test

FAKULTAS ILMU SOSIAL DAN HUKUM Kampus Ketintang, Jalan Ketintang, Suratisya 60231 Laman: <u>https://fish.unesu.ac.id</u> email : fish@.unesu.ac.id UNESA SI Pondidikan Ecografi Jurusan / Prodi NILAI ASIYATUL FARIMAH /1700 4027 4020 Nama / NIM HIDROLDEI UTS Mata Kuliah RABU / 7 NOVEMBER 2018 Hari/ Tanggal Tanda Tangan 1). Diketahui : Lyar DAS = 24 km² c = 0,5 Intensitas hujan: 100 mm / hari Ditanija: Rumus Hidrologi DAS Dawab : Q = C.I.A = 0,5 × 100 mm/hari × 24 km² = 0,5 × 0,1 M/hari × 24.000.000 m2 = 1.200.000 m3/hari atou 50.000 m3/jam 25 atau 13,86 m3/dtk 2). Metode yang paling teliti dalam menghitung rata-rata ewah hujan Metode isobyet merupakan metode yang paling teliti karena dalam perhitungannya memperhatikan gradasi hujan antara satu tempat denan tempat yang lain. Sebagai mana kita ketahui bahwa hujan yang terpati di suatu wilayah tidak sama besarnya antara satu titik dengan titik yang lain dalam wilayah tersebut yang bertaitan dengan topografi 25 wilayahnya. 3). Satu Des dalam hidrologi dijaditan sebagai dasar varian unit penettian hidrologi Dalam satu DPS /DAS merupacan satu sistem aliron air yang dipengaruhi oleh unsur-unsur pembentuk sistem tersebut reperti batian, vegetas topograf: iklim yong membentuk sistem tersebut. Antara PPS yong salu dengan DPS yang lain kondus unsur unsur pembentuk sutere aliron ation berbeda. Dieh Forence itu, Des pertu abjadition satura unit peretition "Growing with character" datam hidrologi. Schalu, DPS mempunyai Kermitan tersendiri yang berbeda dengan DPS yang lain. 20

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h. Sample of of Student's Answer to Assignment, Mid-term, and Final-term Test

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UNESA Laman: <u>https://fish.unesa.ac.id</u> email : <u>fish@.unesa.ac.</u>	i <u>d</u> .						
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