



TEACHING PLAN
BUILDING ENGINEERING VOCATIONAL EDUCATION (BEVE) STUDY PROGRAM
CIVIL ENGINEERING DEPARTMENT, FACULTY OF ENGINEERING, UNIVERSITAS NEGERI PADANG

COURSE	CODE	COURSE CLUSTER	CREDITS		SEM	VERSION
			Theory	Practice		
Topographic Surveying	SIP1.61.3303		2	1	3	1
Lecturer in Charge				Lecturer in Charge <u>Dr. Eng. Nevy Sandra</u> NIP.19791005 200501 2 001		
Remarks	Dean of Faculty of Engineering	Head of Civil Engineering Department	Coordinator of BEVE			
	<u>Dr. Fahmi Rizal, M.Pd., M.T</u> NIP. 195912041985031004	<u>Faisal Ashar, Ph.D.</u> NIP. 19750103 200312 1001	<u>Drs. Revian Body, MSA.</u> NIP. 19600103 198503 1003			
Program Learning Outcomes	Program Learning Outcomes (PLO)					
	<p>By considering input from all stake holders and the minimum requirements set by ASIIN, the PLOs that must be possessed by graduates from the Bachelor of Education in Building Engineering Study Program are determined as follows:</p> <ol style="list-style-type: none"> 1. Master <i>basic knowledge of science</i> (mathematics, natural sciences) and other scientific disciplines that form the basis of building engineering vocational education field for carrying out professional work (<i>Knowledge and Understanding</i>). <ol style="list-style-type: none"> 1.1. Able to implement basic concepts of mathematics and physics to master subjects matter in the field of building engineering vocational education. 1.2. Mastering Statics, Mechanics, Statistics, Technology Materials, and Engineering Drawings as the basic knowledge in the field of building engineering vocational education. 					

2. Able to identify, formulate, solve, and evaluate various technical problems of buildings as the basic ability for teaching in the field of building engineering vocational education (*Engineering analysis, investigation and assessment*).
 - 2.1. Able to identify, formulate, solve, and evaluate technical problems in the field of geotechnical and transportation as the basic ability for teaching in the field of building engineering vocational education.
 - 2.2. Able to identify, formulate, solve, and evaluate technical problems in the field of structure and construction management as the basic ability for teaching in the field of building engineering vocational education.
 - 2.3. Able to identify, formulate, solve, and evaluate technical problems in the field of hydrology as the basic ability for teaching in the field of building engineering vocational education.
3. Possess the ability to design building by taking into account environmental, social, health and work safety issues as the basis for teaching in the field of building engineering vocational education (*Engineering design*).
 - 3.1. Able to make design programming by taking into account environmental, social, health and work safety issues, in cooperation with various party related.
 - 3.2. Able to analyze the design by taking into account environmental, social, health and work safety aspects.
 - 3.3. Able to produce design by taking into account environmental, social, health and work safety aspects.
4. Possess social, managerial, team work, and effective communication competencies, entrepreneurial character, environmental insight and life-long learning habits. (*Transferable and soft skills*).

- 4.1. Possess religious character implemented in personal and professional activities.
- 4.2. Possess the spirit of nationalism, social sensitivity and environmental insight
- 4.3. Able to communicate effectively and work in a team.
- 4.4. Able to transfer science and technology to the community to improve the quality of life
- 4.5. Possess entrepreneurial character

5. Possess the ability to innovate and adapt to the development of science and technology, and implement it into the learning process of building engineering vocational education field by taking into account non-technical risks that may occur (ethical, ecological, commercial, and industrial impact) (*Engineering practice*).
 - 5.1. Able to innovate and use information technology (software) in the field of building engineering vocational education by taking into account the ethical, ecological, commercial and industrial impact.
 - 5.2. Able to use information technology-based equipment (hardware) in field of building engineering vocational education.
6. Possess a good ability to design, implement and evaluate the learning process in the field of building engineering vocational education (*Educational design*).
 - 6.1. Able to design curriculum and learning process of building engineering vocational education.
 - 6.2. Able to implement, control, evaluate and improve the quality of learning process through research in the field of building engineering vocational education.
 - 6.3. Able to develop an effective, efficient, and attractive learning media in the field of building engineering vocational education.

Course Learning Outcomes (CLO): Concrete Technology

Course Learning Outcomes	Course LO		PLO
	1. Have the knowledge and ability to operate the theodolite for measuring angles, distances, elevations and determining coordinates.		
	2. Able to measure the coordinates of polygon for the map traverse		
	3. Able to measure the horizontal angles and determine the coordinates of one point.		
	4. Able to measure and plot contour.		
	5. Able to measure and plot the map layout		
	6. Able to measure in making curves for road/river bends.		
	7. Able to measure in order to check the straightness of the column and determine the coordinate point of building and elevation		
	8. Able to measure the distance, different height, elevation, and coordinate by using an Electro Distance Meter EDM/Total Station and Global Position System GPS devices.		
Course Description	This course provides knowledge and skills about Topography Surveying, how to use theodolite measuring tool, Total Station, GPS and also the planning and aerial measuring of surveying and mapping		
Literature	Main:		
	1. Frick, Heinz. Ilmu dan Alat Ukur Tanah. Yayasan Konisius Yogyakarta. 1991. 2. Gayo, Yusuf. Pengukuran Topografi dan Teknik Pemetaan. PT. Pradnya Paramitha. Jakarta. 1992. 3. Irvine, William. Penyigian untuk Konstruksi. ITB. 1995. 4. Kavanagh, Barry F. Surveying with Construction Application. 3rd Edition. Prentice Hall. 1995. 5. Soemarlana, DS. Latihan Praktek Ukur Tanah dan Pemetaan. Departemen Pendidikan dan Kebudayaan Direktorat Pendidikan Menengah Kejuruan. 1979. 6. Wongsotjitro, Soetomo. Ilmu Ukur tanah. Yayasan Konisius Yogyakarta. 1997.		
	Supporting:		
Teaching Media	1. Ghilani, Charles D. and Wolf, Paul R., Elementary Surveying, An Introduction to Geomatics		
	Software:	Hardware:	
		Computer, LCD Projector and White Board	
Team Teaching			
Assessment	Mid-Semester Exam, Final Exam, Individual and Group Assignment, Group Presentation		
Prerequisite	Survey and mapping basics		

TEACHING MATERIAL

Week	Expected Competency	Study Material	Teaching Method and Strategy	Assignment	Assessment Criteria/ Indicator	Reference
(1)	<ol style="list-style-type: none"> Understanding the learning activity for one semester, Apply the code of conduct in laboratory and field Understanding rights and responsibility Have the knowledge and ability to operate a theodolite for measuring angles, distances, elevation difference and determining coordinates 	Providing the information - Lecture curriculum - Learning materials for one semester theories and field practices - Assessment of theory and field practice - Book references II. Providing all the information below A. Theodolite - Definition of theodolite - Variations of theodolite - Classifications of theodolite - Installation and instructions on how to use a theodolite	Lectures and discussion.	Observe carefully, Summarize	N/A	RU 1,2,3,4,5,6
(2)	CPMK 1 Have the knowledge and ability to operate a theodolite for measuring angles, distances, elevation difference, and determining coordinates	Operating theodolite - Determine the vertical and horizontal angles - Determine the rod reading - Determine the inclined and the horizontal distances - Determine the elevation difference	Lectures and discussion, and demonstration.	Make report	Studiosness Information completeness	RU 1,2,3,4,5,6
(3)	CPMK 1 Able to operate a theodolite for measuring angles, distances,	Measuring the horizontal angle - How to reiterate - How to repeat	Lectures and discussion, and practice	Make report	Studiosness Cooperation Accuracy Completeness	RU 1,2,3,4,5,6

Week	Expected Competency	Study Material	Teaching Method and Strategy	Assignment	Assessment Criteria/ Indicator	Reference
	elevation difference, and determining coordinates					
(4)	CPMK 2 Able to measure the coordinates in Traverse	Definitions of polygons and their functions Variations of polygons - Traverse Polygon - Traverse Link How to measure a coordinate point with Traverse Link	Lectures and discussion, and practice	Make report	Studiosness Cooperation Accuracy Completeness	RU 1,2,3,4,5,6
(5)	CPMK 2 Able to measure the coordinates in Traverse	How to measure a coordinate point with Traverse Polygon	Lectures and discussion, and practice	Make report	Studiosness Cooperation Accuracy Completeness	RU 1,2,3,4,5,6
(6)	CPMK 2 Able to measure the coordinates in Traverse	How to measure a coordinate point with Traverse Polygon	Practice	Make report	Studiosness Cooperation Accuracy Completeness	RU 1,2,3,4,5,6
(7)	CPMK 2 Able to measure the coordinates in Traverse	Data assessment with Traverse Polygon	Lectures and discussion.	Make report	Studiosness Cooperation Accuracy Completeness	RU 1,2,3,4,5,6
(8)	Mid-Semester Exam					
(9)	CPMK 3 Able to measure horizontal angles and determine the coordinates of one point	Intersection and Resection	Lectures and discussion. Practice	Make report	Studiosness Activeness in lectures Tidiness Completeness	RU 1,2,3,4,5,6

Week	Expected Competency	Study Material	Teaching Method and Strategy	Assignment	Assessment Criteria/ Indicator	Reference
(10)	Able to measure and create contour maps	<p>A. Goals and definitions</p> <p>B. Measurement variations and forms</p> <ul style="list-style-type: none"> - Traverse - Details <p>C. Contour map</p> <ul style="list-style-type: none"> - Definition - Understanding of contour line - How to use contour map <p>D. How to read a contour map</p> <ul style="list-style-type: none"> - Polar system - Grid/raimetry system <p>E. Measurement for drawing contour map</p> <ul style="list-style-type: none"> - polar system - grid system <p>F. Calculating and drawing contour map</p> <p>Polar system</p>	Lectures and discussion, and practice	Make report	<p>Studiosness</p> <p>Cooperation</p> <p>Accuracy</p> <p>Completeness</p>	<p>RU</p> <p>1,2,3,4,5,6</p>
(11)	CPMK 5 Able to measure for making map situation	<p>A. Definition of map situation</p> <p>B. Measurement techniques</p>	Lectures and discussion, and practice	Make report	<p>Studiosness</p> <p>Cooperation</p> <p>Accuracy</p> <p>Completeness</p>	<p>RU</p> <p>1,2,3,4,5,6</p>

Week	Expected Competency	Study Material	Teaching Method and Strategy	Assignment	Assessment Criteria/ Indicator	Reference
		C. Drawing and analyzing D. How to measure for making the map situation - Measure the point - Traverse - Detail measurements - Calculating and drawing				
(12)	CPMK 6 Able to measure the horizontal curve	A. Goals of making the horizontal curve B. Horizontal curve forms - Main curve arrow - Detail point C. How to measure for making the horizontal curve	Lectures and discussion, and practice	Make report	Studiosness Cooperation Accuracy Completeness	RU 1,2,3,4,5,6
(13)	CPMK 7 Able to measure the central point of a building and the straightness of the column	A. Measure the central point of a building B. Measure the straightness and the height of the column C. Percentage of the column slope	Lectures and discussion, and practice	Make report	Studiosness Cooperation Accuracy Completeness	RU 1,2,3,4,5,6
(14)	CPMK 8 Able to operate an electronic distance meter (EDM)/Total Station dan Global Position System (GPS) for measuring angles, distances, elevation difference, and determining coordinates	A. Variations of electro-optical devices B. Requirements of electro-optical devices C. How to use a digital electro-optical device - Components and their functions - How to read horizontal and vertical angles	Lectures and discussion, and practice	Make report	Studiosness Cooperation Accuracy Completeness	RU 1,2,3,4,5,6

Assessment Components

Mid-Semester Exam	: 20%
Final Exam	: 30%
Field Reports and Presentations	: 40%
<u>Attendance</u>	: 10%
Total	: 100 %

Description of Assessment Level

	Excellent	Good	Satisfy	Fail
Description				
Formulation				
Calculation				
Analysis				

Assessment System

Score Range	Grade Letter	Grade Point	Notes	Score Range	Grade Letter	Grade Point	Notes
85 – 100	A	4.0	Exceptional	55 – 59	C	2.0	Quite Satisfactory
80 – 84	A-	3.6	Excellent	50 – 54	C-	1.6	Poor
75 – 79	B+	3.3	Very Good	40 – 49	D	1.0	Very Poor
70 – 74	B	3.0	Good	≤ 39	E	0.0	Fail
65 – 69	B-	2.6	Fairly Good	-	T	-	Delayed
60 – 64	C+	2.3	Satisfactory				



KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS NEGERI PADANG
JURUSAN TEKNIK BANGUNAN

Alamat: Jl. Prof. Dr. Hamka, Kampus UNP Air Tawar, Padang 25131
Telp. (0751) 7055644, Fax (0751) 7055628, website: www.ft.unp.ac.id, e-mail: info@ft.unp.ac.id

MID-SEMESTER EXAM (FIELD TEST)

Course : **Topographic Surveying**
Code / Credits : SIP.... /4
Type of Exam : Open Book
Lecturer : Team
Time Allocation : 10 minutes
Maximum Grade : 100 (20%)

Tasks:

1. Make sure the theodolite in the level as instructed
2. Draw the sketch of the location
3. Point to the north or the other assigned point
4. The angle should be 90 degrees vertically
5. Point to the target
6. Leave a note on the horizontal angle
7. Make sure to write the data you picked from the optical rod
8. The total duration is 10 minutes

Name:

Student number:

Signature:

Drawing sketch:

Evaluation:

Tests	Percentage (%)	Scale 1-10	Points
Leveling equipment	2		
Vertical angle	3		
Horizontal angle	5		
Data from the optical rod	4		
Sketch	4		
Time	2		
<i>Fast (1-5 minutes)</i>			
<i>Moderate (5-10 minutes)</i>			
<i>Expected (10 minutes)</i>			
Total	20%		



KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS NEGERI PADANG
JURUSAN TEKNIK BANGUNAN

Alamat: Jl. Prof. Dr. Hamka, Kampus UNP Air Tawar, Padang 25131
Telp. (0751) 7055644, Fax (0751) 7055628, website: www.ft.unp.ac.id, e-mail: info@ft.unp.ac.id

FINAL EXAM

Course : **Topographic Surveying**
Code / Credits : SIP.... /4
Type of Exam : Open Book
Lecturer : Team
Time Allocation : 120 minutes
Maximum Grade : 100 (30%)

Based on the information and the measurement result in the area, we have collected all the data of Traverse Polygon below:

1. Point A is located on the following coordinates (+250.00, -250.00)
2. Azimuth, $\alpha_{ab} = 270^{\circ}0'00''$
3. The measurement goes clockwise
4. The collected data are below:

Points	Angles			Distances (d)
	°	'	''	m
A	224	59	57	A – B = 200.000
B	44	59	57	B – C = 282.843
C	134	59	57	C – D = 200.000
D	89	59	57	D – E = 400.000
E	44	59	57	E – A = 282.843

TASKS:

1. Write the code on your sheet.
2. Calculate the coordinates of B, C, D, E on the table
3. Calculate the area on the table,
4. Draw the area on the drawing paper with the right scale and complete it with all the symbols and other information.

Bobot

1. Row 1 until 15, Weighted 27.5%
2. Scale drawing, Weighted 2.5%