TEACHING-LEARNING CONTRACT

LEARNING PROGRAM OUTLINE

LEARNING UNIT PROGRAM

DATA ANALYSIS

PAS 134

STATISTICS STUDY PROGRAM OF MATHEMATICS DEPARTMENT
MATHEMATICS AND SCIENCE FACULTY
DIPONEGORO UNIVERSITY
SEMARANG
2007

TEACHING-LEARNING CONTRACT

Course Title	**: Data Analysis**
Code	**: PAS 134**
Credit	**: 3**
Semester	**: V**

1. Course Advantage

Analysing data represent one of the main activitities in Statistics. This course studying about how the data can be analysed so that can be found the interesting things in it and can be taken as many as possible information of data. After following this course, the students expected to have good rationale about how data ought to be treated.

2. Course Description

Data Analysis are the course which studying about how to handling data, start from seeing the plot and its description, include the divergence of data (by diagram and also summary of data numeric), explorating to the data, so that can find things withdrawing from this, then handling of data use some certain analysis.

3. General Instructional Aim

After following this course students are expected can explore to data, making stem and leaf diagram, comparing data with diagram visually, conducting data transformation, and also analyse variance and regression.

4. Lecture Strategic

This lecturing methods are by explaining in front of class. It started with definition of concept, then given by examples related to the items given. Student will give opinion and idea whereof which implied in datas which examplize.

Besides also given the task to create data randomly by computer and asked the students to explore as many as possible to the data which, so that can seen how far their understanding to existing items.

Another task given as exercise that can be done at home and its score give contribution to the final result of this course.

5. References

[1] Aunuddin. 1989. Analysis Data. Institute Agriculture of Bogor, Bogor.

[2] Dra. Sri Haryatmi Kartiko, M.Sc., 1986. Analysis Statistical. Published by Karunika Jakarta, Open University. Jakarta.

6. Scoring Criteria

Criteria of scoring in this course is :

A	4
AB	3,5
B	3
BC	2,5
C	2
CD	1,5
D	1
E	0

Final score decision is based on this scoring indicator such as :

Quiz	20 %
Midterm	40 %
Final Exam	40 %

7. Lecture Schedule

Week	Material	Reference
1	Intoduction to Data Analysis	[1] 1 – 5; [2] 1.1 – 1.13
2	Single Struktural Data	[1] 6 – 23; [2] 1.14 – 1.31
3	Stem and Leaf Diagram and Data Comparing	[1] 24 – 36; [2] 2.2 – 2.15, 3.2 – 3.15
4	Divergence of Data and Transformation of Data	[1] 37 – 43; [2] 2.24 – 2.36, 3.16 – 3.32
5	Couple Data, Equation of Line of Resisten	[1] 44 – 59
6	Example of Analyse and Transformation to Linear Pattern	[1] 60 – 82; [2] 4.2 – 4.35
7	Checking of Data Divergences	[1] 84 – 107;
8	Midterm	

9	Prediction	[1] 108 – 120; [2] 5.2 – 5.12
10	Smallest Square Prediction in Regression	[1] 128 – 134
11	Addition of Variable Independent to Simple Regression (Double Regression Models) and Plots of b Prediction Divergence	[1] 135 – 152
12	Checking Errors	[1] 154 – 166
13	Regression Model Validation	[1] 167 – 172
14	Weighted Least Square Method	[1] 173 – 175
15	Robust Regression	[1] 175 – 185
16	Final Exam	

LEARNING PROGRAM OUTLINE

Course Title : Data Analysis

Code / Credit : PAS 134 / 3

Course Description : Data Analysis are the course which studying about how to handling data, start from seeing the plot and its description, include the divergence of data (by diagram and also summary of data numeric), explorating to the data, so that can find things withdrawing from this, then handling of data use some certain analysis.

General Instructional Aim : After following this course students are expected can explore to data, making stem and leaf diagram, comparing data with diagram visually, conducting data transformation, and also analyse variance and regression.

No.	Specific Instructional Aim	Subject	Sub Subject	Duration	Reference
1.	After studying this course, students are expected to have ability to explain about data meaning analysis which can be done to it	Introduction to Data Analysis	▪ Mean of Data ▪ Data = Estimation + Error	120 menit	[1] 1 – 5; [2] 1.1 – 1.13
2.	After studying this course, students are expected to have ability to analyze single data, making stem and leaf diagram, data summary, and also can determine data transformation	Single Structural Data	▪ Data Summary ▪ Transformation for data simetricity	120 minutes	[1] 6 – 23; [2] 1.14 – 1.31
3.	After studying this course, students are expected to have ability to make Box-plot, comparing data and do transformation for span homogeneity (so the data can be compared).	Box-plot and Data Comparing	▪ Box-plot ▪ Data Comparing ▪ Span Homogeneity Transformation	240 minutes	[1] 24 – 43; [2] 2.2 – 2.36, 3.2 – 3.32

4.	After studying this course, students are expected to have ability to explain about couple data and the line which connect (linearly) both, make resisten line, and transform data to straighten line	Couple Data, Equation of Line of Resisten	▪ Resisten line and its iteration ▪ Some analysis example ▪ Transformation to straight line	240 minutes	[1] 44 – 82; [2] 4.2 – 4.35
5.	After studying this course, students are expected to have ability to check data divergence assumption by Box-plot and Quantil-quantil plot	Checking of Data Divergences	▪ Checking data by Box-plot ▪ Checking data by Quantil-quantil plot	120 minutes	[1] 84 – 107
6.	After studying this course, students are expected to have ability to explain and determine mean estimation and its confidence interval, and understanding about some other mean estimation.	Estimation	▪ Mean estimation and its confidence interval ▪ Some other mean estimation	120 minutes	[1] 108 – 120 [2] 5.2 – 5.12
7.	After studying this course, students are expected to have ability to determine regression analysis by least square estimation, adding independent variables to simple or double regression, and plots of b prediction divergence	Regression Analysis	▪ Least Square Estimation ▪ Double regression model ▪ Plots of b Prediction Divergence	240 minutes	[1] 128 – 152
8.	After studying this course, students are expected to have ability to check for error, extreme data and validating regression model	Checking Error and Regression Model Validation	▪ Standard error ▪ Extreme data and observation ▪ Model Validation	240 minutes	[1] 154 – 172

9.	After studying this course, students are expected to have ability to explain about weighted least square methods and Robust Regression	Weighted least square methods	▪ Weighted least square methods ▪ Robust Regression	240 minutes	[1] 173 – 185

References

[1] Aunuddin. 1989. Analysis Data. Institute Agriculture of Bogor, Bogor.

[2] Dra. Sri Haryatmi Kartiko, M.Sc., 1986. Analysis Statistical. Published by Karunika Jakarta, Open University. Jakarta.

LEARNING UNIT PROGRAM

COURSE TITLE : DATA ANALYSIS
CODE / CREDIT : PAS 134 / 3
DURATION : 120 MINUTES
WEEK : 1

A. INSTRUCTIONAL AIM

1. GENERAL : After following this course students are expected can explore to data, making stem and leaf diagram, comparing data with diagram visually, conducting data transformation, and also analyse variance and regression.
2. SPECIFIC : After studying this course, students are expected to have ability to explain about data meaning analysis which can be done to it

B. SUBJECT : Introduction to Data Analysis

C. SUB SUBJECT : - Mean of Data
- Data = Estimation + Error

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	▪ Describing about matter at the first meeting ▪ Describing about general and specific objectives competences	Observing and taking notes	White board
PRESENTATION	▪ Explaining about data meaning and its analysis. ▪ Giving examples as a study case and solving together	Observing, asking, taking notes	White board and paper
CLOSING	▪ Discussion ▪ Giving some exercise to try at home	Discuss, observing, asking, taking	White board and paper

	▪ Giving description about matter on the next meeting	notes.	

E. ASSESSMENT : Giving problems to the students

F. REFERENCE : Aunuddin. 1989. *Analysis Data*. Institute Agriculture of Bogor, Bogor.

Dra. Sri Haryatmi Kartiko, M.Sc., 1986. *Analysis Statistical*. Published by Karunika Jakarta, Open University. Jakarta.

LEARNING UNIT PROGRAM

COURSE TITLE : DATA ANALYSIS

CODE / CREDIT : PAS 134 / 3

DURATION : 120 MINUTES

WEEK : 2

A. INSTRUCTIONAL AIM

1. GENERAL : After following this course students are expected can explore to data, making stem and leaf diagram, comparing data with diagram visually, conducting data transformation, and also analyse variance and regression.

2. SPECIFIC : After studying this course, students are expected to have ability to analyze single data, making stem and leaf diagram, data summary, and also can determine data transformation

B. SUBJECT : Single Structural Data

C. SUB SUBJECT : - Data Summary
- Transformation for data simetricity

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	▪ Describing about matter at the 2nd meeting ▪ Explaining about data summary	Observing	White board
PRESENTATION	▪ Explaining about stem and leaf diagram meaning and how to make it, transformation for data simetricity ▪ Giving examples as a study case and solving together	Observing, asking, taking notes	White board and paper

CLOSING	▪ Discussion ▪ Giving some exercise to try at home ▪ Giving description about matter on the next meeting	Discuss, asking, taking notes, observing	White board and paper

E. ASSESSMENT : Giving problems to the students

F. REFERENCE : Aunuddin. 1989. *Analysis Data.* Institute Agriculture of Bogor, Bogor.

Dra. Sri Haryatmi Kartiko, M.Sc., 1986. *Analysis Statistical.* Published by Karunika Jakarta, Open University. Jakarta.

LEARNING UNIT PROGRAM

COURSE TITLE : DATA ANALYSIS

CODE / CREDIT : PAS 134 / 3

DURATION : 240 MINUTES

WEEK : 3 and 4

A. INSTRUCTIONAL AIM

1. GENERAL : After following this course students are expected can explore to data, making stem and leaf diagram, comparing data with diagram visually, conducting data transformation, and also analyse variance and regression.

2. SPECIFIC : After studying this course, students are expected to have ability to make Box-plot, comparing data and do transformation for span homogeneity (so the data can be compared).

B. SUBJECT : Box-plot and Data Comparing

C. SUB SUBJECT : - Box-plot
- Data Comparing
- Span Homogeneity Transformation

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	▪ Describing about matter at the 3rd and 4th meeting ▪ Describing about general and specific objectives competences	Observing	OHP, transparancy
PRESENTATION	▪ Explaining about Box-plot and how to compare some data by the diagram, and also explain about transformasion for span	Observing, asking, taking notes	White board, paper

	homogeneity ▪ Giving examples as a study case and solving together		
CLOSING	▪ Discussion ▪ Giving description about matter on the next meeting	Asking, discuss, observing	White board, paper

E. ASSESSMENT : Giving problems to the students

F. REFERENCE : Aunuddin. 1989. *Analysis Data.* Institute Agriculture of Bogor, Bogor.

Dra. Sri Haryatmi Kartiko, M.Sc., 1986. *Analysis Statistical.* Published by Karunika Jakarta, Open University. Jakarta.

LEARNING UNIT PROGRAM

COURSE TITLE : DATA ANALYSIS

CODE / CREDIT : PAS 134 / 3

DURATION : 240 MINUTES

WEEK : 5 and 6

A. INSTRUCTIONAL AIM

1. GENERAL : After following this course students are expected can explore to data, making stem and leaf diagram, comparing data with diagram visually, conducting data transformation, and also analyse variance and regression.

2. SPECIFIC : After studying this course, students are expected to have ability to explain about couple data and the line which connect (linearly) both, make resisten line, and transform data to straighten line.

B. SUBJECT : Couple Data, Equation of Line of Resisten

C. SUB SUBJECT : - Resisten line and its iteration
- Some analysis example
- Transformation to straight line

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	▪ Describing about matter at the 5th and 6th meeting ▪ Describing about general and specific objectives competences	Observing	White board
PRESENTATION	▪ Explaining about couple data and the line which connect (linearly) both, resisten line and transform data to straighten line.	Observing, asking, taking notes	White board, paper

	▪ Giving examples as a study case and solving together		
CLOSING	▪ Discussion ▪ Giving description about matter on the next meeting	Discuss, observing, taking notes	White board, paper

E. ASSESSMENT : Giving problems to the students

F. REFERENCE : Aunuddin. 1989. *Analysis Data.* Institute Agriculture of Bogor, Bogor.

Dra. Sri Haryatmi Kartiko, M.Sc., 1986. *Analysis Statistical.* Published by Karunika Jakarta, Open University. Jakarta.

LEARNING UNIT PROGRAM

COURSE TITLE : DATA ANALYSIS

CODE / CREDIT : PAS 134 / 3

DURATION : 120 MINUTES

WEEK : 7

A. INSTRUCTIONAL AIM

1. GENERAL : After following this course students are expected can explore to data, making stem and leaf diagram, comparing data with diagram visually, conducting data transformation, and also analyse variance and regression.

2. SPECIFIC : After studying this course, students are expected to have ability to check data divergence assumption by Box-plot and Quantil-quantil plot

B. SUBJECT : Checking of Data Divergences

C. SUB SUBJECT : - Checking data by Box-plot
- Checking data by Quantil-quantil plot

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	▪ Describing about matter at the 7^{th} meeting ▪ Explaining about divergence data assumption ▪ Describing about general and specific objectives competences	Observing	White board
PRESENTATION	▪ Menjelaskan cara pemerik-saan asumsi sebaran data dengan diagram kotak-garis dan plot kuantil-kuantil	Observing, asking, taking notes	White board, paper

	▪ Giving examples as a study case and solving together		
CLOSING	▪ Giving some exercise to try at home ▪ Giving description about matter on the next meeting	Taking notes, observing	White board, paper

E. ASSESSMENT : Giving problems to the students

F. REFERENCE : Aunuddin. 1989. *Analysis Data*. Institute Agriculture of Bogor, Bogor.

Dra. Sri Haryatmi Kartiko, M.Sc., 1986. *Analysis Statistical*. Published by Karunika Jakarta, Open University. Jakarta.

LEARNING UNIT PROGRAM

COURSE TITLE : DATA ANALYSIS
CODE / CREDIT : PAS 134 / 3
DURATION : 120 MINUTES
WEEK : 9

A. INSTRUCTIONAL AIM

1. GENERAL : After following this course students are expected can explore to data, making stem and leaf diagram, comparing data with diagram visually, conducting data transformation, and also analyse variance and regression.

2. SPECIFIC : After studying this course, students are expected to have ability to explain and determine mean estimation and its confidence interval, and understanding about some other mean estimation.

B. SUBJECT : Estimation

C. SUB SUBJECT : - Mean estimation and its confidence interval
- Some other mean estimation

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	▪ Describing about matter at the 9th meeting ▪ Describing about general and specific objectives competences	Observing	OHP, tranparancy
PRESENTATION	▪ Explaining about mean estimation and its confidence interval, and other mean estimation. ▪ Giving examples as a study case and solving together	Observing, asking, taking notes	OHP, tranparancy, white board, paper

CLOSING	▪ Discussion ▪ Giving some exercise to try at home	Observing, discuss, taking notes	White board and paper

E. ASSESSMENT : Giving problems to the students

F. REFERENCE : Aunuddin. 1989. *Analysis Data.* Institute Agriculture of Bogor, Bogor.

Dra. Sri Haryatmi Kartiko, M.Sc., 1986. *Analysis Statistical.* Published by Karunika Jakarta, Open University. Jakarta.

LEARNING UNIT PROGRAM

COURSE TITLE : DATA ANALYSIS

CODE / CREDIT : PAS 134 / 3

DURATION : 240 MINUTES

WEEK : 10 and 11

A. INSTRUCTIONAL AIM

1. GENERAL : After following this course students are expected can explore to data, making stem and leaf diagram, comparing data with diagram visually, conducting data transformation, and also analyse variance and regression.

2. SPECIFIC : After studying this course, students are expected to have ability to determine regression analysis by least square estimation, adding independent variables to simple or double regression, and plots of b prediction divergence

B. SUBJECT : Regression Analysis

C. SUB SUBJECT : - Least Square Estimation
- Double regression model
- Plots of b Prediction Divergence

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	▪ Describing about matter at the 10^{th} and 11^{th} meeting ▪ Explaining about regression analysis concept ▪ Describing about general and specific objectives competences	Observing	OHP, transparancy
PRESENTATION	▪ Explain about how to determine regression	Observing, taking notes,	OHP, transparancy,

	analysis by least square estimation, adding independent variables to simple or double regression, and plots of b prediction divergence ▪ Giving examples as a study case and solving together	asking	white board, paper
CLOSING	▪ Discussion ▪ Giving some exercise to try at home ▪ Giving description about matter on the next meeting	Taking notes, observing, discuss	White board, paper

E. ASSESSMENT : Giving problems to the students

F. REFERENCE : Aunuddin. 1989. *Analysis Data.* Institute Agriculture of Bogor, Bogor.

Dra. Sri Haryatmi Kartiko, M.Sc., 1986. *Analysis Statistical.* Published by Karunika Jakarta, Open University. Jakarta.

LEARNING UNIT PROGRAM

COURSE TITLE : DATA ANALYSIS
CODE / CREDIT : PAS 134 / 3
DURATION : 240 MINUTES
WEEK : 12 and 13

A. INSTRUCTIONAL AIM

1. GENERAL : After following this course students are expected can explore to data, making stem and leaf diagram, comparing data with diagram visually, conducting data transformation, and also analyse variance and regression.

2. SPECIFIC : After studying this course, students are expected to have ability to check for error, extreme data and validating regression model

B. SUBJECT : Checking Error and Regression Model Validation

C. SUB SUBJECT : - Standard error
- Extreme data and observation
- Model Validation

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	▪ Describing about matter at the 12th and 13th meeting ▪ Describing about general and specific objectives competences	Observing	OHP, transparancy, white board
PRESENTATION	▪ Explaining extreme data, validating regression model ▪ Giving examples as a study case and solving together	Observing, asking, taking notes	White board, paper
CLOSING	▪ Discussion ▪ Giving some exercise to try	Taking notes, observing	White board, paper

	at home ▪ Giving description about matter on the next meeting		

E. ASSESSMENT : Giving problems to the students

F. REFERENCE : Aunuddin. 1989. *Analysis Data.* Institute Agriculture of Bogor, Bogor.

Dra. Sri Haryatmi Kartiko, M.Sc., 1986. *Analysis Statistical.* Published by Karunika Jakarta, Open University. Jakarta.

LEARNING UNIT PROGRAM

COURSE TITLE : DATA ANALYSIS
CODE / CREDIT : PAS 134 / 3
DURATION : 240 MINUTES
WEEK : 14 and 15

A. INSTRUCTIONAL AIM

1. GENERAL : After following this course students are expected can explore to data, making stem and leaf diagram, comparing data with diagram visually, conducting data transformation, and also analyse variance and regression.

2. SPECIFIC : After studying this course, students are expected to have ability to explain about weighted least square methods and Robust Regression

B. SUBJECT : Weighted least square methods

C. SUB SUBJECT : - Weighted least square methods
- Robust Regression

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	▪ Describing about matter at the 14^{th} and 15^{th} meeting ▪ Describing about general and specific objectives competences	Observing	OHP, transparancy, white board
PRESENTATION	▪ Explaining about weighted least square methods and Robust Regression ▪ Giving examples as a study case and solving together	Observing, asking, taking notes	White board, kertas
CLOSING	▪ Discussion	Discuss,	White board,

	▪ Giving some exercise to try at home ▪ Giving description about final exams materials	observing, taking notes	paper

E. ASSESSMENT : Giving problems to the students and solve together

F. REFERENCE : Aunuddin. 1989. *Analysis Data*. Institute Agriculture of Bogor, Bogor.

Dra. Sri Haryatmi Kartiko, M.Sc., 1986. *Analysis Statistical*. Published by Karunika Jakarta, Open University. Jakarta.