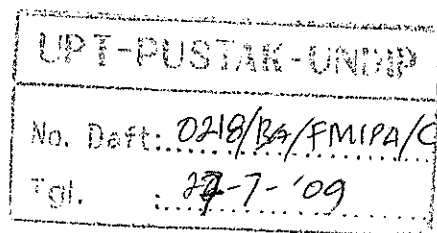




TEACHING-LEARNING CONTRACT
LEARNING PROGRAM OUTLINE
LEARNING UNIT PROGRAM

MATHEMATICAL STATISTIC 2
PAS 306



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

TEACHING – LEARNING CONTRACT

Course Title : Mathematical Statistics 2

Code : PAS 306

Credit : 3

Semester : 4

1. Course Advantage

The course of Elementary Statistics (Method of Statistics) student introduced by some statistical measure, hypothesis test and intervall of konfidence. Its emphasis [student can use method / existing formula. In this course Mathematical Statisticss, more emphasized at the basis for theory about statistical inference of goodness in the form of point estimation, interval estimation and also hypothesis testing.

2. Course Description

This course include; parameter estimatation and hypothesis testing. Parameter estimation include point estimation and interval estimatation . Point estimation with classic approach use method of moments and maximum likelihood estimators. Studied also evaluate estimator include unbias, consistent and minimum variance. Determination of interval estimation use two method that is method of inverse hypothesis testing and and pivotal quantity. The hypothesis testing explained about hypothesis meaning, simple hypothesis , composite hypothesis , error of type of I and of II, function test, power test, most powerful test, uniformly most powerful test, and generalized likelihood test ratio.

3. General Instructional Aim

After attend the lecture this student expected can make inference about population parameter in the form of point estimation, intervall estimation and hypothesis testing.

4. Lecture Strategic.

To reach the target of this course this study system use two way teaching methods, that are lecturing and discussing. To increase the activity of student are given some assignation in the form of quiz in the class, and task that self done at home.

5. References

1. Bain, L.J and Engelhart, M. (1992). Introduction to Probability and Mathematical Statistics. Second Edition, Duxbury Press, Belmont, California.
2. Casella, G and Berger, R.L. (1990). Statistical Inference. Wadsworth Inc. Belmont, California.
3. Dudewicz, E.J and Mishra, S.N. (1988). Modern Mathematical Statistics. John Willey and Sons. Singapore.
4. Tatik Widiharih, (2007). Buku Ajar Statistika Matematika II. Program Studi Statistika , Jurusan Matematika, FMIPA Undip.

6. Scoring Criteria.

Criteria of scoring in this course is :

scoring	value
A	4.0
AB	3.5
B	3.0
BC	2.5
C	2.0
CD	1.5
D	1.0
DE	0.5
E	0.0

Determination of scoring criteria is used weighted such as :

No	Component	Percentage
1	Quiz	15
2	Self-done task	15
3	Midterm	30
4	Final exam	40

7. Lecture Schedule

week	material	references
1	1. Teaching-learning contract 2. Intoduction 3. Methods of moments	[1] : 288-292 [2] : 284-288 [3] : 362-367 [4] : modul 1
2	Maximum likelihood estimators	[1] : 292-301 [2] : 289-297 [3] : 347-362 [4] : modul 1
3	Methods of evaluating estimators (unbias, mean squared error, consistency)	[1] : 302-304; 311-314 [2] : 303-306;322-324 [4] : modul 1
4	Best unbiased estimators Quiz I Task I	[1] : 304-311 [2] : 307-316 [4] ; modul 1
5	Sufficient statistics, completely statisticss	[1] : 335-344 [2] : 246-254 [3] : 392-416 [4] : modul 2
6	Exponensial family	[1] : 350-351 {2} : 113-115
7	Completeness and unbiasedness relation. Quiz II Task II	[1] : 344-349 [2] : 316-322 [3] : 418-425 [4] : modul 2
8	Midterm	-
9	Hypothesis testing, simple and composite hypotesis , function test, power test	[1] : 389-397 [2] : 345-346; 358-361 [3] : 432-442 [4] : modul 3
10	Most powerful test	[1] : 406-411 [2] : 365-370 [3] : 444-450 [4] : modul 3
11	Uniformly most powerful test	[1] : 411-415 [3] : 450-468 [4] : modul 3
12	Generalized Likelihooh Ratio Test. Quiz III Task III	[1] : 417-422 {2} : 346-351 [3] : 514-527 [4] : modul 3
13	Interval estimation	[1] : 358-362 [2] : 403-405 [4] : modul 4
14	Methods of inverse hypothesis testing	[3] : 572-575 [4] : modul 4

15	Pivotal quantity methods	[1] : 362-367 [2] : 413-416 [4] : modul 4
16	Final exam	-

LEARNING PROGRAM OUTLINE

Course Title : Mathematical Statistics 2

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Course Description

This course include; parameter estimation and hypothesis testing. Parameter estimation include point estimation and interval estimation . Point estimation with classic approach use method of moments and maximum likelihood estimators. Studied also evaluate estimator include unbiased, consistent and minimum variance. Determination of interval estimation use two method that is method of inverse hypothesis testing and pivotal quantity. The hypothesis testing explained about hypothesis meaning, simple hypothesis , composite hypothesis , error of type of I and of II, function test, power test, most powerful test, uniformly most powerful test, and generalized likelihood test ratio.

General Instructional Aim

After attend the lecture this student expected can make inference about population parameter in the form of point estimation, interval estimation and hypothesis testing.

No	Specific Instructional Aim	Subject	Subsubject	duration	references
1	The students can to mention the aim, advantage and process of studying	Teaching learning contract	General instructional aim Relevance this course to another course Evaluation and scoring criteria	1x50 minutes	-
2	Student can determine point estimator .	Point Estimation	Methods of moments, Maximum Likelihood Estimators	5x50 minutes	[1]:288-301 [2] :284-297 [3] : 347-367 [4] : modul 1
3	Student can evaluate to obtained estimator.	Methods of Evaluating Estimators	Unbias, mean squared error, consistency, best unbiased estimator	6x50 minutes	[1] : 302-314 [2] : 303-324 [3] : 336-337

					[4] : modul 1
4	Student can define and determine sufficient statistics and completely statistics.	Sufficient and completely statistics	Sufficient statistics Completely statistics	3x50 minutes	[1] : 335-344 [2] : 240-254 [3] : 392-416 [4] : modul 2
5	Student can prove a distribution is exponential family.	Exponential family	Exponential family	3x50 minutes	[1] : 350-351 [2] : 113-115 [4] : modul 2
6	Student can determine best unbiased estimators.	Best unbiased estimators	Rao Blackwell theorem, Cramer Rao Lower Bound	3x50 minutes	[1] : 344-349 [2] : 316-322 [3] : 418-427 [4] : modul 2
7	Student can determine test statistics, statistical tables, criterion test from hypothesis which have been taken.	Hypothesis testing	Hypothesis testing, simple and composite hypothesis, function test, power test, most powerful test, uniformly most powerful test, generalized likelihood ratio test	12x50 minutes	[1] : 389-422 [2] : 345-370 [3] : 432-527 [4] : modul 3
8	Student can Construction interval confidence of parameter population	Interval estimation	Methods of inverse hypothesis testing. Pivotal quantity methods	9x50 minutes	[1] : 358-367 [2] : 403-416 [3] : 572-575 [4] : modul 4

References:

1. Bain, L.J and Engelhart, M. (1992). Introduction to Probability and Mathematical Statistics. Second Edition, Duxbury Press, Belmont, California.
3. Casella, G and Berger, R.L. (1990). Statistical Inference. Wadsworth Inc. Belmont, California.
3. Dudewicz, E.J and Mishra, S.N. (1988). Modern Mathematical Statistics. John Willey and Sons. Singapore.
4. Tatik Widiharih, (2007). Buku Ajar Statistika Matematika II. Program Studi Statistika, Jurusan Matematika, FMIPA Undip.

LEARNING UNIT PROGRAM

Course Title : Mathematical Statistics 2

Code : PAS 306

Credit : 3

Duration : 6x50 minutes

Week : 1,2

A. INSTRUCTIONAL AIM

1. General : After attend the lecture this student expected can make inference about population parameter in the form of point estimation, intervall estimation and hypothesis testing.

2. Specific : Student can determine point estimator .

B. SUBJECT : Point Estimation

C. SUB SUBJECT : 1. Methods of moments

2. Maximum likelihood estimators

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	1.Submitting teaching-learning contract 2.Explaining relevance this course with the other course 3.Explaining general aim	Observing and taking notes	OHP, transparency White board
PRESENTATION	1.Explaining the parameter, statistics and sample observation 2.Explaining principle method of moments, and how determine its. 3. Explaining principle maximum likelihood estimators.	Observing, asking, taking notes, doing task	OHP, transparency White board.

	4. Giving example 5. Giving task		
CLOSING	1. Giving comment to work student. 2. Giving task to be done at home 3. Describing material at week 3.	Answering to, discussion	White board

E. ASSESSMENT : Giving problem to the students..

F. REFERENCES :

1. Bain, L.J and Engelhart, M. (1992). Introduction to Probability and Mathematical Statistics. Second Edition, Duxbury Press, Belmont, California.
2. Casella, G and Berger, R.L. (1990). Statistical Inference. Wadsworth Inc. Belmont, California.
3. Dudewicz, E.J and Mishra, S.N. (1988). Modern Mathematical Statistics. John Willey and Sons. Singapore.
4. Tatik Widiharini, (2007). Buku Ajar Statistika Matematika II. Program Studi Statistika , Jurusan Matematika, FMIPA Undip.

LEARNING UNIT PROGRAM

Course Title : Mathematical Statistics 2

Code : PAS 306

Credit : 3

Duration : 6x50 minutes

Week : 3,4

A. INSTRUCTIONAL AIM

1. General : After attend the lecture this student expected can make inference about population parameter in the form of point estimation, intervall estimation and hypothesis testing.

2. Specific : Student can evaluate to obtained estimator.

B. SUBJECT : Methods of Evaluating Estimators

- C. SUB SUBJECT :**
1. Unbias estimators
 2. Mean squared error
 3. Consistensy
 4. Best unbias estimators

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	<ol style="list-style-type: none"> 1. Giving opportunity to student to ask previous items which not yet been mastered 2. Explaining relevance this section with previous section 3. Explaining the material for this section 	Observing and taking notes	OHP, transparency White board
PRESENTATION	<ol style="list-style-type: none"> 1. Explaining the unbias estimators 2. Explaining mean squared error and consistency. 	Observing, asking, taking notes, doing task	OHP, transparency White board.

	3. Explaining best unbiased estimators 4. Giving example 5. Giving task		
CLOSING	1. Giving comment to work student. 2. Giving task to be done at home 3. Describing material next week .	Answering to, discussion	White board

E. ASSESSMENT : Giving problem to the students..

F. REFERENCES :

1. Bain, L.J and Engelhart, M. (1992). Introduction to Probability and Mathematical Statistics. Second Edition, Duxbury Press, Belmont, California.
3. Casella, G and Berger, R.L. (1990). Statistical Inference. Wadsworth Inc. Belmont, California.
3. Dudewicz, E.J and Mishra, S.N. (1988). Modern Mathematical Statistics. John Willey and Sons. Singapore.
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LEARNING UNIT PROGRAM

Course Title : Mathematical Statistics 2

Code : PAS 306

Credit : 3

Duration : 9x50 minutes

Week : 5,6,7

A. INSTRUCTIONAL AIM

1. General : After attend the lecture this student expected can make inference about population parameter in the form of point estimation, intervall estimation and hypothesis testing.
2. Specific : Student can define and determine sufficient statistics, completely statistics, exponential family ang best unbiased estimators.

B. SUBJECT : Sufficient and completly statistics

- C. SUB SUBJECT :**
1. Sufficient statistics
 2. Completly statistics
 3. Exponential family
 4. Best unbiased estimators

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	<ol style="list-style-type: none"> 1. Giving opportunity to student to ask previous items which not yet been mastered 2. Explaining relevance this section with previous section 3. Explaining the material for this section 	Observing and taking notes	OHP, transparency White board
PRESENTATION	<ol style="list-style-type: none"> 1. Explaining to define and determine the 	Observing, asking, taking	OHP, transparency

	sufficient statistics, and completely statistics 2.Explaining the exponential family. 3. Explaining best unbias estimators by sufficient and complete statistics 4. Giving example 5. Giving task	notes, doing task	White board.
CLOSING	1. Giving comment to work student. 2. Giving task to be done at home 3.Describing material for midterm.	Answering to, discussion	White board

E. ASSESSMENT : Giving problem to the students..

F. REFERENCES :

1. Bain, L.J and Engelhart, M. (1992). Introduction to Probability and Mathematical Statistics. Second Edition, Duxbury Press, Belmont, California.
4. Casella, G and Berger, R.L. (1990). Statistical Inference. Wadsworth Inc. Belmont, California.
3. Dudewicz, E.J and Mishra, S.N. (1988). Modern Mathematical Statistics. John Willey and Sons. Singapore.
4. Tatik Widiharih, (2007). Buku Ajar Statistika Matematika II. Program Studi Statistika , Jurusan Matematika, FMIPA Undip.

LEARNING UNIT PROGRAM

Course Title : Mathematical Statistics 2

Code : PAS 306

Credit : 3

Duration : 12x50 minutes

Week : 9,10,11,12

A. INSTRUCTIONAL AIM

1. General : After attend the lecture this student expected can make inference about population parameter in the form of point estimation, intervall estimation and hypothesis testing.
2. Specific : Student can determine test statistics, statistical tables, criterion test from hypothesis which have been taken.

B. SUBJECT : Hypothesis testing

C. SUB SUBJECT : 1. Simple and composite hypotesis.

2. Function test, and power test.

3. Most powerful test

4. Uniformly most powerful test

5. Generalized likelihood ratio test

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	<ol style="list-style-type: none"> 1. Giving opportunity to student to ask previous items which not yet been mastered 2. Explaining relevance this section with previous section 3. Explaining the material for this section 	Observing and taking notes	OHP, transparency White board
PRESENTATION	1. Explaining the simple and	Observing, asking, taking	OHP, transparency

	composite hypothesis, function test and power test. 2.Explaining most powerful test. 3.Explaining uniformly most powerful test 4.Explaining generalized likelihood ratio test 5. Giving example 6. Giving task	notes, doing task	White board.
CLOSING	1. Giving comment to work student. 2. Giving task to be done at home 3.Describing material next week .	Answering to, discussion	White board

E. ASSESSMENT : Giving problem to the students..

F. REFERENCES :

1. Bain, L.J and Engelhart, M. (1992). Introduction to Probability and Mathematical Statistics. Second Edition, Duxbury Press, Belmont, California.
5. Casella, G and Berger, R.L. (1990). Statistical Inference. Wadsworth Inc. Belmont, California.
3. Dudewicz, E.J and Mishra, S.N. (1988). Modern Mathematical Statistics. John Willey and Sons. Singapore.
4. Tatik Widiharih, (2007). Buku Ajar Statistika Matematika II. Program Studi Statistika , Jurusan Matematika, FMIPA Undip.

LEARNING UNIT PROGRAM

Course Title : Mathematical Statistics 2

Code : PAS 306

Credit : 3

Duration : 6x50 minutes

Week : 13,14,15

A. INSTRUCTIONAL AIM

1. General : After attend the lecture this student expected can make inference about population parameter in the form of point estimation, intervall estimation and hypothesis testing.
2. Specific : Student can Construction interval confindence of parameter population

B. SUBJECT : Interval estimation

- C. SUB SUBJECT :**
1. Interval two site and one site.
 2. Methods of inverse hypothesis testing
 3. Pivotal quantity methods.

D. TEACHING-LEARNING ACTIVITIES

STAGE	LECTURER ACTIVITIES	STUDENT ACTIVITIES	LEARNING MEDIA
INTRODUCTION	<ol style="list-style-type: none"> 1. Giving opportunity to student to ask previous items which not yet been mastered 2. Explaining relevance this section with previous section 3. Explaining the material for this section 	Observing and taking notes	OHP, transparency White board
PRESENTATION	<ol style="list-style-type: none"> 1. Explaining principle of interval estimation include two and one site interval 2. Explaining principle 	Observing, asking, taking notes, doing task	OHP, transparency White board.

	method of inverse hypothesis testing 3. Explaining principle pivotal quantity methods. 4. Giving example 5. Giving task		
CLOSING	1. Giving comment to work student. 2. Giving task to be done at home 3. Describing material for final exam.	Answering to, discussion	White board

E. ASSESSMENT : Giving problem to the students..

F. REFERENCES :

1. Bain, L.J and Engelhart, M. (1992). Introduction to Probability and Mathematical Statistics. Second Edition, Duxbury Press, Belmont, California.
6. Casella, G and Berger, R.L. (1990). Statistical Inference. Wadsworth Inc. Belmont, California.
3. Dudewicz, E.J and Mishra, S.N. (1988). Modern Mathematical Statistics. John Willey and Sons. Singapore.
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