

**INTRODUCTIONS
TO MATHEMATICAL LOGIC**

(CREDIT : 3)

CODE : MAT 112

FIRST SEMESTER



UPT-PUSTAK-UNDIP
No. Daft: 0224/BA/PTUPALC
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**Departement of Mathematics
DIPONEGORO UNIVERSITY**

TEACHING PROGRAM UNIT

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC
CODE : MAT 112
CREDITS : 3
Class : 150 seconds
Meeting : 1

A INSTRUCTIONAL GOAL

1. **GENERAL** : After the class the student understand the concept of statement, variable, constant, value of statement with connective
2. **SPECIFIC** : 1 Student can give examples of statement, variable, constant.
2 Student can construct the table of logical statement truth value.

B. TOPIC : Sentences and statement

- C.SUB TOPIC:** 1. Statement, variable, constant
2. Connective

D.ACTIVITY

STEP	LECTURE ACTIVITIES	STUDENT ACTIVITIES	MEDIA
INTRODUCTIONS	1.Explaining the goals, relevancies and benefits	Listening	White board, Black Board,OHP
PRESENTATION	1.Explaining concept of logic,p Statement, variable, constant . 2 Explaining Connective and value of logical sentences	Listening	White board, Black Board,OHP
CLOSING	1.Summary 2. Home work	Learning	White board, Black Board,OHP

F REFERENCES:

- 1 RMJT Soehakso, Aljabar Abstrak (INTRODUCTION TO MATHEMATICAL LOGICMatematika Modern), FMIPA UGM, 1980.
- 2 Theresia M, H Seputra, INTRODUCTION TO MATHEMATICAL LOGIC and Teori Himpunan, Erlangga, 1992
- 3 Yahya Kusuma, Logika Matematika Elementer, Bandung, Penerbit Tarsito

TEACHING PROGRAM UNIT

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC
CODE : MAT 112
CREDITS : 3
Class : 300 seconds
Meeting : 2 and 3

A INSTRUCTIONAL GOAL

1. GENERAL : After the class the student understand the concept of argument validity and rule of inferences
2. SPECIFIC : 1 Student can decide the thruth of argument.
2 Student can take conclusion correctly

B. TOPIC : Argumentation and Deduction Mehode

- C.SUB TOPIC: 1. Induction inferences and Deduction
2. Rule of inferences

D.ACTIVITY

STEP	LECTURE ACTIVITIES	STUDENT ACTIVITIES	MEDIA
INTRODUCTIONS	1.Explaining the goals, relevancies and benefits 2. Reviewing class 1	Listening	White board, Black Board,OHP
PRESENTATION	1. Explaining the concept of argument,deduction methode. 2 Explaining validity of argument and rule of inferences	Listening	White board, Black Board,OHP
CLOSING	1.Summary 2. Home work	Learning	White board, Black Board,OHP

F REFERENCES:

- 4 RMJT Soehakso, Aljabar Abstrak (INTRODUCTION TO MATHEMATICAL LOGICMatematika Modern), FMIPA UGM, 1980.
- 5 Theresia M, H Seputra, INTRODUCTION TO MATHEMATICAL LOGIC and Teori Himpunan, Erlangga, 1992
- 6 Yahya Kusuma, Logika Matematika Elementer, Bandung, Penerbit Tarsito

TEACHING PROGRAM UNIT

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC
CODE : MAT 112
CREDITS : 3
Class : 150 seconds
Meeting : 4

A INSTRUCTIONAL GOAL

1. GENERAL : After the class the student understand the concept of argument validity and rule of inferences
2. SPECIFIC : 1 Student can decide the thruth of argument.
2 Student can take conclusion correctly

B. TOPIC : Argumentation and Deduction Mehode

C.SUB TOPIC: Discussion about Argumentation and Deduction Mehode

D.ACTIVITY

STEP	LECTURE ACTIVITIES	STUDENT ACTIVITIES	MEDIA
INTRODUCTIONS	.Prepare the room ,split the class to some groups, material of discussion to each group		
PRESENTATION	Supervising the discussion	Discuss	Paper, etc
CLOSING	Collecting the report of discussion from each group		

F REFERENCES:

- 1.RMJT Soehakso, Aljabar Abstrak (INTRODUCTION TO MATHEMATICAL LOGICMatematika Modern), FMIPA UGM, 1980.
- 2.Theresia M, H Seputra, INTRODUCTION TO MATHEMATICAL LOGIC and Teori Himpunan, Erlangga, 1992
- 3.Yahya Kusuma, Logika Matematika Elementer, Bandung, Penerbit Tarsito

TEACHING PROGRAM UNIT

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC
CODE : MAT 112
CREDITS : 3
Class : 450 seconds
Meeting : 5,6, and 7

A INSTRUCTIONAL GOAL

1. GENERAL : After the class the student understand the concept of Quantifier and the teory of quantification
2. SPECIFIC :
 - 1 Student understand the concept of preposition function
 - 2.Student can explain Quantifier
 - 3 Student understand the statement containing relation, statement in traditional logic
 4. Student can prove can take conclution from quantifier argument

B. TOPIC : Quantifier and the teory of quantification

- C.SUB TOPIC:
1. Quantifier ,Preposition function
 2. Statement in traditional logic, the statement containing relation
 3. The prove of quantifier validity

D.ACTIVITY

STEP	LECTURE ACTIVITIES	STUDENT ACTIVITIES	MEDIA
INTRODUCTIONS	1.Explaining the goals, relevancies and benefits 2. Reviewing class 4	Listening	White board, Black Board,OHP
PRESENTATION	1. Explaining the concept of quantifier. 2 Explaining The prove of quantifier validity	Listening	White board, Black Board,OHP
CLOSING	1.Summary 2. Home work	Learning	White board, Black Board,OHP

F REFERENCES:

- 1.RMJT Soehakso, Aljabar Abstrak (INTRODUCTION TO MATHEMATICAL LOGICMatematika Modern), FMIPA UGM, 1980.
- 2.Theresia M, H Seputra, INTRODUCTION TO MATHEMATICAL LOGIC and Teori Himpunan, Erlangga, 1992
- 3.Yahya Kusuma, Logika Matematika Elementer, Bandung, Penerbit Tarsito

TEACHING PROGRAM UNIT

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC
CODE : MAT 112
CREDITS : 3
Class : 150 seconds
Meeting : 8

A INSTRUCTIONAL GOAL

1. GENERAL : After the class the student understand the concept of Quantifier and the teory of quantification
2. SPECIFIC : 1 Student understand the concept of preposition function
2.Student can explain Quantifier
3 Student understand the statement containing relation, statement in traditional logic
4. Student can prove can take conclution from quantifier argument

B. TOPIC : Quantifier and the teory of quantification

C.SUB TOPIC: Discussion about :

1. Quantifier ,Preposition function
2. Statement in traditional logic, the statement containing relation
3. The prove of quantifier validity

D.ACTIVITY

STEP	LECTURE ACTIVITIES	STUDENT ACTIVITIES	MEDIA
INTRODUCTIONS	.Prepare the room ,split the class to some groups, material of discussion to each group		
PRESENTATION	Supervising the discussion	Discuss	Paper, etc
CLOSING	Collecting the report of discussion from each group		

F REFERENCES:

- 1.RMJT Soehakso, Aljabar Abstrak (INTRODUCTION TO MATHEMATICAL LOGICMatematika Modern), FMIPA UGM, 1980.
- 2.Theresia M, H Seputra, INTRODUCTION TO MATHEMATICAL LOGIC and Teori Himpunan, Erlangga, 1992
- 3.Yahya Kusuma, Logika Matematika Elementer, Bandung, Penerbit Tarsito

TEACHING PROGRAM UNIT

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC
CODE : MAT 112
CREDITS : 3
Class : 150 seconds
Meeting : 9

A INSTRUCTIONAL GOAL

1. GENERAL : After the class the student know the percentage of the understanding the topics of introduction of mathematical logic course
2. SPECIFICS : After the class the student know the percentage of the understanding the topics of introduction of mathematical logic course

B. TOPIC : Midle Test

C.SUB TOPIC:: Midle Test

D.ACTIVITY

STEP	LECTURE ACTIVITIES	STUDENT ACTIVITIES	MEDIA
INTRODUCTIONS	.Prepare the room ,distribute the problem paper and the worksheet		
PRESENTATION	Supervising the test	Doing the test	Paper, etc
CLOSING	Collecting the answersheet of the test		

TEACHING PROGRAM UNIT

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC
CODE : MAT 112
CREDITS : 3
Class : 150 seconds
Meeting : 10

A INSTRUCTIONAL GOAL

1. GENERAL : After the class the student understand the concept of set
2. SPECIFIC : 1 Student can write the notation of the set and its elemen correctly
2.Student can give some example of set

B. TOPIC : Set

- C.SUB TOPIC: 1. The concept of set
2. The concept of element

D.ACTIVITY

STEP	LECTURE ACTIVITIES	STUDENT ACTIVITIES	MEDIA
INTRODUCTIONS	1.Explaining the goals, relevancies and benefits	Listening	White board, Black Board,OHP
PRESENTATION	1. Explaining the concept of set,elemen and the notation . 2 Giving some example of set	Listening,writing	White board, Black Board,OHP
CLOSING	1.Summary 2. Home work	Learning	White board, Black Board,OHP

F REFERENCES:

- 1.RMJT Soehakso, Aljabar Abstrak (INTRODUCTION TO MATHEMATICAL LOGICMatematika Modern), FMIPA UGM, 1980.
- 2.Theresia M, H Seputra, INTRODUCTION TO MATHEMATICAL LOGIC and Teori Himpunan, Erlangga, 1992
- 3.Yahya Kusuma, Logika Matematika Elementer, Bandung, Penerbit Tarsito

TEACHING PROGRAM UNIT

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC
CODE : MAT 112
CREDITS : 3
Class : 300 seconds
Meeting : 11 and 12

A INSTRUCTIONAL GOAL

1. GENERAL : After the class the student understand the concept of relation and the operation of set
2. SPECIFIC : 1 Student understand the concept of relation between set and able to give examples
2. Student understand the concept of operation of the set and able to give examples

B. TOPIC : Set

- C.SUB TOPIC: 1. Relation of between Set
2.Operation between Set

D.ACTIVITY

STEP	LECTURE ACTIVITIES	STUDENT ACTIVITIES	MEDIA
INTRODUCTIONS	1.Explaining the goals, relevancies and benefits 2. Reviewing class 10	Listening,writing	White board, Black Board,OHP
PRESENTATION	1. Explaining the concept of Relation between set. 2 Explaining the concept of Operation	Listening,writing	White board, Black Board,OHP
CLOSING	1.Summary 2. Home work	Learning	White board, Black Board,OHP

F REFERENCES:

- 1.RMJT Soehakso, Aljabar Abstrak (INTRODUCTION TO MATHEMATICAL LOGICMatematika Modern), FMIPA UGM, 1980.
- 2.Theresia M, H Seputra, INTRODUCTION TO MATHEMATICAL LOGIC and Teori Himpunan, Erlangga, 1992
- 3.Yahya Kusuma, Logika Matematika Elementer, Bandung, Penerbit Tarsito

TEACHING PROGRAM UNIT

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC
CODE : MAT 112
CREDITS : 3
Class : 150 seconds
Meeting : 13

A INSTRUCTIONAL GOAL

1. GENERAL : After the class the student understand the concept of relation and the operation of set
2. SPECIFIC :
 - 1 Student understand the concept of relation between set and able to give examples
 2. Student understand the concept of operation of the set and able to give examples

B. TOPIC : Set

C.SUB TOPIC: Discuss about :

1. Relation of between Set
- 2.Operation between Set

D.ACTIVITY

STEP	LECTURE ACTIVITIES	STUDENT ACTIVITIES	MEDIA
INTRODUCTIONS	.Prepare the room ,split the class to some groups, material of discussion to each group		
PRESENTATION	Supervising the discussion	Discuss	Paper, etc
CLOSING	Collecting the report of discussion from each group		

F REFERENCES:

- 1.RMJT Soehakso, Aljabar Abstrak (INTRODUCTION TO MATHEMATICAL LOGICMatematika Modern), FMIPA UGM, 1980.
- 2.Theresia M, H Seputra, INTRODUCTION TO MATHEMATICAL LOGIC and Teori Himpunan, Erlangga, 1992
- 3.Yahya Kusuma, Logika Matematika Elementer, Bandung, Penerbit Tarsito

TEACHING PROGRAM UNIT

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC
CODE : MAT 112
CREDITS : 3
Class : 300 seconds
Meeting : 14 and 15

A INSTRUCTIONAL GOAL

1. GENERAL : After the class the student understand the concept of Function
2. SPECIFIC : 1 Student understand the concept of relation
2. Student understand the concept of Function

B. TOPIC : Function

- C.SUB TOPIC: 1. Relation
2. Function

D.ACTIVITY

STEP	LECTURE ACTIVITIES	STUDENT ACTIVITIES	MEDIA
INTRODUCTIONS	1.Explaining the goals, relevancies and benefits 2. Reviewing class 13	Listening, writing	White board, Black Board,OHP
PRESENTATION	1. Explaining the concept of Relation 2 Explaining the concept of Function	Listening, writing	White board, Black Board,OHP
CLOSING	1.Summary 2. Home work	Learning	White board, Black Board,OHP

F REFERENCES:

- 1.RMJT Soehakso, Aljabar Abstrak (INTRODUCTION TO MATHEMATICAL LOGICMatematika Modern), FMIPA UGM, 1980.
- 2.Theresia M, H Seputra, INTRODUCTION TO MATHEMATICAL LOGIC and Teori Himpunan, Erlangga, 1992
- 3.Yahya Kusuma, Logika Matematika Elementer, Bandung, Penerbit Tarsito

TEACHING PROGRAM UNIT

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC
CODE : MAT 112
CREDITS : 3
Class : 150 seconds
Meeting : 9

A INSTRUCTIONAL GOAL

1. GENERAL : After the class the student know the percentage of the understanding the topics of introduction of mathematical logic course
2. SPECIFICS : After the class the student know the percentage of the understanding the topics of introduction of mathematical logic course

B. TOPIC : Final Test

C.SUB TOPIC: Final Test

D.ACTIVITY

STEP	LECTURE ACTIVITIES	STUDENT ACTIVITIES	MEDIA
INTRODUCTIONS	.Prepare the room ,distribute the problem paper and the worksheet		
PRESENTATION	Supervising the test	Doing the test	Paper, etc
CLOSING	Collecting the answersheet of the test		

TEACHING PROGRAM OUTLINE

SUBJECT : INTRODUCTION TO MATHEMATICAL LOGIC

CODE/CREDITS : MAT112/3

DESCRIPTION :

INTRODUCTION TO MATHEMATICAL LOGIC is the part of Mathematics containing some methods and techniques for taking conclusion of argument correctly .It help student develop their logical ability to solve more complex problems. The subject studying some methods and techniques for taking conclusion of argument correctly and precise logical thinking. The discussion of the topics beginning from the concept of statement, argument, variable, constant, deduction method, induction, quantifier sentence statement and validity of quantifier argument , the concept of set and function

GENERAL INTRUCTIONAL GOAL:

After the course the student understand the concept of argument validity and rule of inference appropriate to the methods given and understand the concept of quantifier, the teory of quantification , the concept of set and function ..

no	SPECIFIC INTRUCTIONAL GOAL	TOPIC	Sub TOPIC	TIME	References
1.	Student is able to give example of statements, variable and constants, construct the table of logical truth and state the truth of argument	Sentence and Statement	Statement .Variable,constant Connective,Induction and deduction inference	150'	Ref 1, Ref 2 and Ref 3
2	Student is able to take conclusions correctly	Argument and Methods of Deduction	Rule of argument inference	450'	Ref 1, Ref 2 and Ref 3

3	Student is able to prove and take conclusions from quantifier	Quantifier and Theory of Quantification	Proposition function, quantifier Statement in traditional logic, Proof of quantifier validity	600'	Ref 1, Ref 2 and Ref 3
4	Student is able to write sets and its element by the correct notation.	Sets	Concept of Set	150'	Ref 1, Ref 2 and Ref 3
5	Student is able to do operation between	Sets	Operation between sets	300'	Ref 1, Ref 2 and Ref 3
6.	Student is able to give example of relations and to explain their property	Relation	Relation and Function	450'	Ref 1, Ref 2 and Ref 3