



## COURSE SYLLABUS

Faculty : Mathematics and Natural Sciences  
Department : Mathematics Education  
Course / Code : Number Theory / MAT 312  
Credits : Theory: 2 SKS                      Practice: - SKS  
Semester : 2<sup>nd</sup>  
Prerequisite/Code : -  
Lecturer : Ariyadi Wijaya, M.Sc

### I. Course Description :

This course focuses on the properties of integer number including divisibility, prime numbers, greatest common divisor, least common multiple, congruency, number theoretic functions, primitive root, and indices.

### II. Standard Competency:

Students are expected to be able to: (1) explain the properties of integer numbers; (2) apply the properties of integer numbers, (3) prove mathematical statement.

### III. Lesson strategies :

- Expository
- Discussion

### IV. Lesson Plan :

Week	Basic Competencies	Topic	Lesson Strategies	References
1	Introduction to Number Theory	1. Mathematical induction 2. The Binomial Theorem		A: 1 - 12
2 and	Divisibility	1. Algorithm		B: 35 – 41,

3		2. The properties of divisibility		B: 80 - 89
4	Integer representations and operations.	1. Base-10 (decimal) 2. Non-decimal		B: 42 – 53
5	Greatest common divisor and Least common multiple	1. Greatest common divisor 2. Least common multiple		A: 13 – 25
6	Fundamental Theorem of Arithmetic	1. Prime number 2. Single factorization		A: 25-39
7	<b>EXAM</b>			
8 and 9	Congruences	1. Introduction to congruences 2. Linear congruences		A: 40-66
10	Special Congruences	1. Fermat's Theorem 2. Wilson's Theorem		A: 67-80
11 and 12	Number Theoretic Function	1. The sum and numbers of divisors 2. Mobius inversion formula 3. Greatest integer function		A: 81 – 103
13	Euler's Phi Function and Euler's Theorem	1. Euler's Phi Function 2. Euler's Theorem		A: 104 – 119
14	<b>EXAM</b>			
15 and 16	Primitive Roots and Indices	1. The order of an integer modulo $m$ 2. Primitive roots 3. The theory of indices		A: 120 – 144
	<b>EXAM</b>			

V. References :

[A] Sukirman.2001. *Teori Bilangan*. Yogyakarta: FMIPA UNY  
 [B] Rosen, Kenneth H. 1993. *Elementary Number Theory and Its Applications*. New York: Addison – Wesley Publishing Company  
 [C] Burton, M. David. 1986. *Elementary Number Theory Revised Printing*. Boston: Allyn and Bacon, Inc

VI. Evaluation :

Number	Components of Evaluation	Percentage (%)
1	Participation	5
2	Tasks	15
3	Mid Semester Exam 1	20
4	Mid Semester Exam 2	20
5	Final Exam	40
Total		100%

Yogyakarta, .....

Head of Department .....

Lecturer,

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