DEPARTEMEN PENDIDIKAN NASIONAL
UNIVERSITAS NEGERI YOGYAKARTA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
Alamat: Karangmalang, Yogyakarta – 55281
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Lampiran-1

SYLLABUS

Faculty	:	Mathematics and Natural Sciences
Study Program	:	Mathematics Education
Course name/code	:	Number Theory & MAT312
UOC	:	Theory: 2 uoc ; Practicum: 0 uoc
Semester	:	2
Required course name/code	:	Logic and Sets & MAT302
Lecturer	:	Endah Retnowati, M.Ed.

I. Description of the course

This course contains properties of integer including divisibility, number representation, prime number, Greatest Common Factor (GCD), Lowest Common Multiple (LCM), congruences and its application, arithmetic theorems, primitive roots and indices.

II. Standard of Competence

Students have skills and understanding of concepts and properties of integer and able to solve proof and application problems.

III. Lecture Strategy

- ✓ Discussion
- ✓ Tutorial
- ✓ Individual assignments
- ✓ Group assignments

IV. Lecture Planning

Meeting	Standar of Competency	Indicator	Main Material	Lecture Strategy	Reference
1	Understand of principle of mathematical induction and binomial theorem and related theorems and apply these to problem solving	a. Performing proof of mathematical statements using principal of induction	Principle of mathematical induction	Discussion Tutorial	A: 3 - 17
2		b. Applying binomial theorem to determine coefficients within raised two-term algebraic forms c. Performing proof of mathematical statements using binomial theorem	Binomial Theorem	Discussion Tutorial	A: 18 – 31
3	Explaining divisibility, GCD and LCM and calculating GCD and LCM of integers	a. Using divisibility to solve problems	Divisibility	Discussion Tutorial	A: 33 – 37

4		b. Detemining GCD	GCD	Discussion Tutorial	A: 38 – 49
5		c. Determining LCM	LCM	Discussion Tutorial	A: 49 – 54
6	Representing integer on its basis used in system of position and canonic form	a. Changing representation of an integer on particular basis b. Determining results of operations of integers with non-decimal basis	Numerical Basis	Discussion Tutorial	A: 55 – 68
7	Understanding prime numbers and unique factorization	a. Testing prime number b. Determining prime factors and applying in problem solving	Prime factorisation	Discussion Tutorial	A: 69 – 86
8	Explaining congruence concept and applying the concept to linier congruency, Diophantine equation and related problems	a. Explain definition and properties of congruences and implement these to problem solving and Diophantine equation	Congruences	Discussion Tutorial	A: 87 – 123
9		b. Solving linier congruences and linier congruence systems	Linier Congruence System	Discussion Tutorial	A: 123 – 135
10	Mid-Exam				
11	Explaining fermat's theorem, wilson's theorem and apply to problem solving	a. Performing proof of fermat's theorem and apply the theorem in problem solving b. Performing proof of wilson's theorem and apply the theorem in problem solving c. Testing prime numbers using these theorems	Fermat's theorem Wilson's theorem	Discussion Tutorial	A: 136 – 153
12	Explaining arithmetic functions and solve these to solve problems	a. Giving example of τ (tau) function and applying the theorem in problem solving b. Giving example of σ (sigma) function and applying the theorem in problem solving	Arithmetic fuctions	Discussion Tutorial	A: 154 – 169
13		c. Giving example of Mobius (μ = mu) and applying the theorem in problem solving d. Giving example of greatest integer function and applying the theorem in problem solving	Arithmetic functions	Discussion Tutorial	A: 169 – 184
14	Explain phi function and Euler theorem and apply in problem solving	a. Solving problems related to phi function b. Prove Euler function and apply the theorem in problem solving	Phi Function	Discussion Tutorial	A: 185 – 206

15	Determine primitive root and index and apply in problem solving	a. Determine order of an integer modulo m b. Solving problems related to primitive roots	Primitive roots	Discussion Tutorial	A: 207 – 227
16		c. Determine indices of integers and solve related problems	Indices	Discussion Tutorial	A: 228 – 237

IV. **References**

A. Compulsary
Sukirman, 2001. *Teori Bilangan.* Yogyakarta: FMIPA Universitas Negeri Yogyakarta

B. Recommended
Mollin, Richard A. 1998. *Fundamental Number Theory with Applications*. Washington: CRC Press.

V. Evaluation

No	Component	Weight (%)
1	In Class Participation	30%
2	Assignment	30%
3	Mid Exam	20%
4	Final Exam	20%
	Total	100%

Yogyakarta, 15 Agustus 2009
Lecturer,

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