Course : **Number Theory (MT 305)**

Semester : **2 (Two)**

Credit : **2 (Two)**

UNIT OF LECTURE PROGRAM

Week	Topic/subtopic	General Objectives	Specific Objectives	Matter	Approach/ method	Media	Assessment	Sources
1st	Introduction, proving methods (direct, indirect, and mathematical Induction)	1. Students understand and Know several proving methods and can use them for solving number theory problems 2. Students undestand and Know definitions, concepts, and theorems in Divisibility and	After attending this course, students are able to: 1. Know several proving methods 2. Use proving methods in solving problems	1. Direct proving method 2. Indirect proving method (contrapositive and contradiction) 3. Mathematical Induction	Lecture, class discussion, group discussion, individual tasks.	LCD, Board, Textbooks	Assessment for this course includes: 1. Presence 2. Tasks (individual and groups) 3. Exam 1 4. Exam 2	1. Burton, D.M. (1998). *Elementary Number Theory.* The McGraw-Hill Companies, Inc. 2. Rosen, K.H. (1992). *Elementary Number Theory and Its Application.* Addison-Wesley Publishing Company. 3. Sembiring, S. (2002). *Olimpiade Matematika untuk SMU.* Bandung: Yrama Widya. 4. Strayer, J.K. (1994).
2nd	Divisibility: definition and several its properties (theorems).		3. Know definition of divisibility 4. Prove theorems about divisibility 5. Solve problems about divisibility	1. Definition of Divisibility 2. Properties (theorems) of divisibilty;				

3rd	Division algorithm and related theorems.	Congruences and use them in solving problems	6. Know division algorithem 7. Read the prove of Division algoritm theorems	1. Division Algorithm (DA) 2. Theorems which related to DA				*Elementary Number Theory.* Boston: PWS Publishing Company.
4th	Prime numbers: definition, several theorems, several conjectures about prime numbers.		8. Know definition of prime number 9. Read and re-write proof of prime numbers 10. Know several conjectures of prime numbers	1. Definition of prime number 2. Theorems about prime numbers 3. Conjectures about prime numbers				5. Suherman, E., Turmudi. (1992). *Pengantar Teori Bilangan untuk Guru dan Calon Guru di SD, SMTP, dan SMTA.* Bandung: Alpha Omega.
5th	Greatest Common Divisors (GCD): definition, and its theorems		11. Know definition of GCD, liear combinatio n of GCD 12. Read and re-write theorems about GCD.	1. Definition of Greatest Common Divisor (GCD) 2. Theorems about GCD (linear combination, pairwise relatively prime, etc)				6. Sukirman. (2006). *Pengantar Teori Bilangan.* Yogyakarta: Hanggar Kreator. 7. Tung, K.Y. (2008). *Memahami Teori Bilangan dengan Mudah dan Menarik.* Jakarta: Grasindo.
6th	The Euclidean Algorithm as a		13. Know Euclidean	1. The Euclidean algorithm and				

			algorithme	its application				
	tool to find GCD and related theorems.		14. Use the Euclidean algorithm for finding GCD					
7th	The Fundamental Theorem of Arithmetic		15. Know the FTA and use it for solving problems 16. Read and re-write proofs of the theorems which relates to FTA	1. Fundamental Theorem of Arithmetic (FTA) 2. Several theorems related to FTA and its application				
8th	Exercises before Exam 1.		17. Know connection between subtopics and use them to solve problems	Topics from 1st to week 7th				
9th	Sub-topics from 1st to 8th week		-	Exam 1				
10th	Congruences: definition and its		18. know definition of congruence and	1. Definition of congruence 2. theorems about				

			theorems related to it and use them to solve problems	congruences				
11th	Linear Congruences		19. Use theorem of linear congruences to solve linear congruences problems	1. Defintiion of linear congruences 2. Theorem about linear congruences				
12th	The Chinese Remainder Theorem		20. Solve problems about Chinese remainder theorem 21. Read and re-write the proof of Chinese remainder theorem	1. Chinese remainder theorem				
13th	Wilson, Euler, and Fermat's Little Theorems		22. Use Wilson's, Fermat's and Euler's theorems to solve problems	1. Wilson's theorem 2. Fermat little's theorem 3. Euler's theorem				

14th	Linear Diophantine Equation		23. Solve linear Diophantine equation	1.Linear Diophantine equation			
15th	Exercises before Exam 2 and review of the course		24. Know connection between subtopics in congruences and use them to solve problems	1.Subtopic from 10th week to 14th week			
16th	Sub-topics from 10th to 15th week		-	Exam 2			

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