UNIVERSITAS NEGERI PADANG
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
MATHEMATICS DEPARTMENT, MATHEMATICS STUDY PROGRAM
Main Campus Universitas Negeri Padang.
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Bachelor of Science in Mathematics   MODULE HANDBOOK

Module name:	Number Theory
Module level, if applicable:	Bachelor
Code:	MAT2.62.5003
Subheading, if applicable:	-
Classes, if applicable:	Number Theory
Semester:	5th (fifth)
Module coordinator:	Head of Algebra Expertise Group
Lecturer(s):	Dra. Arnellis, M.Si, Drs. Yusmet Rizal, M.Si., and Defri Ahmad, S.Pd., M.Si.
Language:	Indonesian Language and English
Classification within the curriculum:	Elective course in the third year (5th semester) Bachelor Degree
Teaching format / class hours per week during the semester:	a. Lectures : Problem Based Learning with methods such as expository, discussion, and drill. (3 x 50 minutes = 150 minutes) b. Structured assignment : Weekly individual/group written assignment. (3 x 60 minutes = 180 minutes). c. Individual study (3 x 60 minutes = 180 minutes).
Workload:	The total workload is 136 hours per semester, which consists of 150 minutes lectures, 180 minutes structured assignment, and 180 minutes of individual study. In total, there are 16 weeks per semester, including midterm and final exams.
Credit points:	3 SKS = 4.53 ECTS.
Prerequisites course(s):	None.

Course Outcomes:	Students should be able to do the following after completing this course: ● CO 1. Explain the constructions of all number systems. ● CO 2. Prove the elementary properties of integer systems. ● CO 3. Solve the mathematical problems using number theory. ● CO 4. Apply mathematical problems using number theory. ● CO 5: Using the elementary properties, demonstrate any advanced properties of number theory. ● CO 6: Apply number theory to mathematical problems.
Content	● Review of Direct and Indirect Proof, and Proof by Mathematical Induction ● Integer Number System ● Divisor, prime numbers, prime factorization ● Unity Factorization: greatest common divisor and least common multiplication ● Definition of divisions and their properties, division algorithms and algebraic identities ● Incongruity of Integers ● Euclid's Algorithm, Linear congruence linear ● Linear Diophantine Equation for Two or More Variables ● Non Linear Diophantine Equations and Methods of Solutions. ● Applications of Congruence of Integers: Chinese Remainder Theorem, Fermat's, Wilson and Euler Theorems.
Study/exam achievements:	The final grade will be weighted as follows: The assessment consists of a final exam (45%), a midterm exam (30%), assignment (20%), and class activities /discussion (5%). The final and midterm exams are essay tests with a closed book (120 minutes). In class, students build the concept (discussion) based on the problem that is related to this course. Each student gets a weekly assignment as an individual or group.
Forms of media:	White Board, laptop, Projector, e-learning via elearning2.unp.ac.id, and zoom meeting.

Literature:	Hand Book:
	  1 Richard Michael Hill, 2018, Introduction to Number Theory, World Scientific.
	  2 Surodjo, B, 2014, Diktat Teori Bilangan, BOPTN, UGM
	  3 Santos, David A. 2007. Number Theory for Mathematical Contests. Free Software Foundation, Inc.
	Textbook and Article:
	  1. Titu, A., Andrica, D., dan Feng Z, 2006, 104 Number Theory, Problems, Berlin
	  2. Andreescu, Titu and Andrica, Dorin. 2002. *An Introduction to Diophantine Equations*. Cil Publishing House, Romania.
	  3. Budhi, Wono Setya. 2005. *Langkah Awal Menuju ke Olimpiade Matematika*. Edisi 1. CV Ricardo, Jakarta

PLO and CO Mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1						✔				
CO2			✔							
CO3									✔	
CO4			✔							
CO5			✔							
CO6									✔	