Bachelor Program in Mathematics Education   **MODULE HANDBOOK**

Module designation	:	Number Theory / GMA2102
Semester	:	3rd (third) / Odd
Person responsible for the module	:	Prof. Dr. Yusuf Hartono Weni Dwi Pratiwi, S.Pd., M.Sc.
Language	:	Indonesian and English
Relation to the curriculum	:	Study Program Compulsory Course
Teaching methods	:	- Expository, and Class Discussion. (Week 1 - week 15) - Structured Assignment (Week 2 - week 15) - Independent Activities. (Week 2 - week 15) 3 x 170 minutes = 510 minutes = 8.50 hours
Workload	:	14 weeks per semester, excluding mid-term and final exams. 1 sks per week = 170 minutes, consisting of 50 minutes synchronous learning + 60 minutes asynchronous learning + 60 minutes systematic project 170 minutes x 3 sks = 510 Minutes =136 hours = 8.5 hours per week Credit point 3 SKS = 3 x 1.6 = 4.8 ECTS
Credit points	:	3 SKS (4.8 ECTS)
Prerequisite's course(s)	:	-
Module objectives	:	After completing this course, the students have ability to: CO1: Describe basic concepts of integers, divisibility, GCD, LCM, Prime numbers, arithmetic basic theorems, Modular Arithmetic, Diophantine Equations, and Integer Functions. CO2: Interpret the concepts of integers, divisibility, GCD, LCM, Prime numbers, basic arithmetic theorems, Modular Arithmetic, Diophantine's Equations, and Integer Number Functions.Functions in solving problems. CO3: Analyze problems related to the concept of integers, divisibility, GCD, LCM, prime numbers, basic arithmetic theorem, Modular Arithmetic, Diophantine's Equation, and Integer Number Functions. CO4: Apply the concepts of integers, divisibility, GCD, LCM, prime numbers, basic arithmetic theorems, Modular Arithmetic, Diophantine's Equations, and Integer. ons.

Content	:	This course discusses: 1. number system: integer and mathematical induction 2. divisibility 3. Greatest Common Divisor (GCD) 4. Continued fraction and Least Common Multiple (LCM) 5. basic arithmetic theorems 6. prime numbers 7. modular arithmetic 8. Diophantine's equations 9. integer functions 10. Wilson's and Fermat Theorem 11. Euler's Theorem
Examination forms	:	Examination in this course includes: 1. Affective (actively participating during classroom processes and responsibility in doing assignments) 2. Tasks 3. Mid-term test in the 8th meeting: essay test 4. final test: essay test

Study and examination requirements	:	Total Score = (30% x Midterm Exam Score) + (45% x Final Exam Score) + (20% x Assignment) (5% x Class Activities: Participation, Attitude, and Presence)
		
		Explanation:
		
		1. Midterm Exam
		    ● Midterm Exam is held at the 8th meeting
		    ● Midterm Exam is a written exam (essay test) and carried out in the classroom with an implementation time of 100 minutes according to the module schedule.
		
		2. Final Exam
		
		    ● Final Exam is held at the 16th meeting in
		    ● Final Exam is a written exam (essay test) and carried out in the classroom with an implementation time of 120 minutes which follows the Final Exam implementation schedule of the department.

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3. Assignment

- Assignments are given as exercise before Midterm Exam and before Final Exam.
- Assignments are about analyzing problem in daily life and solve it with the concept of the content in number theory.
- Assignments are given as structured assignment and it is submitted in limited time.

4. Affective Assessment

- Affective asessment is held in every meeting by observing students' attitude in the classroom.
- The assesment is based on the observation sheet by using the given scoring rubrics

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<td>Reading lists</td>
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1. Hardy, G. H. and E. M. Wright. 1981. *An Introduction to the Theory of Numbers*. Fifth Edition. Oxford: Oxford University Press
2. Jones, G. A. and J. M. Jones. 1998. *Elementary Number Theory*. London: Springer-Verlag
3. Niven, Ivan *et al*. 1991. *An Introduction to the Theory of Numbers*. New York: John Wiley& Sons
4. Rosen, K. H. 2005. *Elementary Number Theory and It's Applications*. 5th Edition. Massachusetts: Addison Wesley.
5. Sukirman. 2008. *Materi Pokok Teori Bilangan*. Modul 1 – 6. Jakarta: Penerbit Universitas Terbuka.
6. Tattersall, J. J. 2005. *Elementary Number Theory in Nine Chapters*. 2nd Edition. Cambridge: Cambridge University Press.
7. LeVeque, William J. 1996. Fundamentals of Number Theory. New York: Dover Publications, Inc.

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Date of last amendments: January 2023

PLO	CO

PLO	CO
PLO 4: Having knowledge of mathematical concepts in solving mathematical problems and supporting further studies.	CO1: Describe basic concepts of integers, divisibility, GCD, LCM, Prime numbers, arithmetic basic theorems, Modular Arithmetic, Diophantine Equations, and Integer Functions. CO2: Interpret the concepts of integers, divisibility, GCD, LCM, Prime numbers, basic arithmetic theorems, Modular Arithmetic, Diophantine's Equations, and Integer Number Functions.Functions in solving problems.
PLO 7: Able to apply mathematical knowledge logically, critically and systematically in solving problems.	CO3: Analyze problems related to the concept of integers, divisibility, GCD, LCM, prime numbers, basic arithmetic theorem, Modular Arithmetic, Diophantine's Equation, and Integer Number Functions.
PLO 10: Able to utilize technology in solving mathematics and learning problems.	CO4: Apply the concepts of integers, divisibility, GCD, LCM, prime numbers, basic arithmetic theorems, Modular Arithmetic, Diophantine's Equations, and Integer.