Module Description of Algebraic Structures

Module Name	:	Algebraic Structures
Module Level	:	Bachelor
Code, if applicable	:	23H01121403
Subtitle, if applicable	:	-
Courses, if applicable	:	Algebraic Structures
Semester(s) in which the module is taught	:	4 (Fourth Semester)
Module coordinator(s)	:	Prof. Dr. Amir Kamal Amir, M.Sc.
Lecturer(s)	:	Dra. Nur Erawati, M.Si.
Language	:	Bahasa (Indonesian language)
Relation to curriculum	:	Compulsory course in second year for Bachelor degree in Mathematics
Type of teaching/teaching method	:	Lecturing, Small Group Discussion, Cooperative Learning, Self-Directed Learning, Case Method
Contact hours	:	150 minutes lectures per week, 180 minutes structured activities per week, and 180 minutes independent study per week
Workload	:	Total workload is 135 hours per semester which consists of 40 hours per semester for Learning and Teaching, 47.5 hours per semester for Self-Study, and 47.5 hours per semester for Structured Works
Credit points	:	3 (4.8 ECTS)
Requirements according to the examination regulations	:	Students are required to attend at least 80% of the total meetings which is recorded via the attendance menu at https://sikola-v2.unhas.ac.id/, complete all mandatory assignments, and obtain permission from the lecturer to participate in the examination.
Recommended prerequisites	:	Students have completed and taken the exams for Linear Algebra II
Module objectives/intended learning outcomes	:	After the completion of this module, the student will be able to: CLO 1. using group and ring concepts to prove theorems in algebra; CLO 2. apply theorems to prove other results in Algebra; CLO 3. communicate mathematical ideas both orally and in writing with the group. The following is the mapping of the ILO and the CLO of this course:

	ILO 2	ILO 3	ILO 4
CLO 1	X	X	
CLO 2	X	X	
CLO 3	X		X

Content	:	Algebraic structures cover abstract algebra with a focus on non-empty sets with one or two binary operators, as well as the application of logic and algebraic concepts in problem solving. Topics covered include basic concepts of functions and binary operators, groups and subgroups, cyclic groups, permutation groups, cosets and Lagrange's Theorem, abelian groups, factor groups, homomorphisms, kernels, and images. Additionally, the course covers simple groups, group centers, normal subgroups, ring structures, and homomorphisms between rings, including an introduction to fields.
Study and examination requirements	:	Study and examination requirements: ● Students must attend 15 minutes before the class starts. ● Students must switch off all electronic devices. ● Students must inform the lecturer if they will not attend the class due to sickness, etc. ● Students must submit all class assignments before the deadline. Students must attend the exam to get final grade.
Exams and assessment formats	:	Participants are marked based on their performance in theory: Report (50%), Presentation (30%), and Assignments (20%). Assignments assess student's ability to apply concepts independently, while Reports measure analytical and writing skills. Presentations evaluate oral communication, organization of ideas, and confidence in delivering academic material. Altogether, these components account for 100% of the final grade. Students are marked based on their percentage of points obtained and based on the following grade scale: <table><tr><th>Percentage of Achievement</th><th>Grade</th><th>Conversion Value</th></tr><tr><td>85 – 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - <85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.5</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.0</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.5</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table>
Reading list	:	1. Fraleigh, John B.; A First Course In Abstract Algebra, Edisi Ke 5, Addison Wesley, 1994. 2. Dummit, David S.; Foote, Richard M.; Abstract Algebra, Prentice Hall, 1991.

		3. Manuscript of abstract algebra textbook
		4. Textbook 'Basic Concepts of Inner Product Space'
Last revision date	:	February 5th, 2025