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MODULE HANDBOOK

Module name	Introduction to Algebraic Structure II
Module level, if applicable	Bachelor
Code, if applicable	MMM-2201
Subtitle, if applicable	-
Courses, if applicable	Introduction to Algebraic Structure II
Semester(s) in which the module is taught	3rd (third)
Person responsible for the module	Chair of Algebra Research Group
Lecturer(s)	Prof. Dr. Sri Wahyuni
Language	Bahasa Indonesia
Relation to curriculum	Compulsary course in the second year (3rd semester) Bachelor Degree
Type of teaching, contact hours	150 minutes lectures and 180 minutes structured activities (homework and task) per week.
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 180 minutes structured activities per week, 180 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.
Credit points	3
Requirements according to the examination regulations	Students have taken Introduction to Algebraic Structure II course (MMM-2201) and have an examination card where the course is stated on.
Recommended prerequisites	Students have taken Introduction to Algebraic Structure I course (MMM-1203) and have participated in the final examination of the course.
Module objectives/intended learning outcomes	**Learning objectives:** On successful completion of this module, students will be able to: **CO1:** recognize and analize the basic the basic concept of rings as an algebraic structure consisting of one set and two operation, and manipulating skills in applying basic concepts, properties, techniques, and methods for ring developments. **CO2:** demonstrate knowledge of basic concept of a subring and ideal, and ring factor from an ideal; forming an ideal generate by a subset of a ring, center of a ring, character of a ring and nilpotent elements. **CO3:** derive and apply the concept of ring homomorphism, its kernel and image, and the basic properties including monomorphism, epimorphism, isomorphism, and the fundamental ring homomorphism theorem, and the uses. **CO4:** recognize and analize knowledge of basic concepts of zero divisor, inverse of an element, integral domain and field, the relation between the integral domain and field, construction of a field from an integral domain, prime ideal and maximal ideal and its properties. **CO5:** demonstrate knowledge the concept of rings of polynomials over field, degree of a polynomial, division algorithm, and its generalization to Euclidean domain, and principal ideal domain.

Content	**Syllabus: The syllabus consist of** • Rings, examples, properties, and technics in contruction of new rins from given rings. • Subring, ideal, and contruction of ring of quotients (ring factor) from an ideal. Ideal generated by a subset (generator). Center of rings, and nilpotent elements. • Ring homomorphisms, kernel and image. Monomorphism, epimorphism, and isomorphisms. Fundamental ring homomorphism theorem and its uses. • Zero divisor, inverse of an element, integral domain and field, the relation between integral domain and field, construction of a field from an integral domain (field of fractions), prime ideal and maximal ideal and its properties. Prime ideal, and maximal ideal. • Rings of polynomials over field, degree of polynomial, division algorithm, and its generalization to Euclidean domain, and principal ideal domain.
Study and examination requirements and forms of examination	The final mark will be weighted as follows: No Assessment methods (components, activities) Weight (percentage) 1 Final Examination 40% 2 Mid-Term Examination 30% 3 Class Activities: Quiz, Homework, etc. 30% The initial cut-off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively
Media employed	Board, LCD Projector, Laptop/Computer
Reading List	1. Minking Eie, Shou-Te Chang, 2017, A Course on Abstract Algebra, World Scientific 2. J.S. Milne, 2017, **"Group Theory",** Copyright c 1996–2017 http://www.jmilne.org/math/CourseNotes/GT.pdf 3. N. Jackson, 2017, **"A Course in Abstract Algebra",** http://homepages.warwick.ac.uk/~maseay/doc/aalg.pdf 4. J. Moore, 2014, "**Introduction to Abstract Algebra"**, 1st Edition, Academic Press. (https://www.elsevier.com/books/introduction-to-abstract-algebra/moore/978-0-08-092488-5) 5. A. Machì, 2012, "**Groups: An Introduction to Ideas and Methods of the Theory of Groups"**, Springer Milan Heidelberg New York Dordrecht London © Springer-Verlag Italia. https://www.springer.com/gp/book/9788847024205 , http://scienze-como.uninsubria.it/previtali/Teoria%20dei%20Gruppi/Machi-Groups.pdf 6. W. Keith Nicholson. 2012, **"Introduction to abstract algebra"**, Wiley-Interscience [John Wiley & Sons], Hoboken, NJ, fourth edition, 2012. https://books.google.co.id/books/about/Introduction_to_Abstract_Algebra.html?id=w-GaLpapRcEC&redir_esc=y 7. Thomas W. Judson , 2012, **"Abstract Algebra Theory and Applications**", Stephen F. Austin State University, http://abstract.ups.edu/download/aata-20120811.pdf 8. KH Fieseler, 2010, **"Groups, Rings and Fields",** http://www2.math.uu.se/~khf/dachs.pdf 9. Landin. J., 2010, *An Introduction to Algbraic Structure*, Dover Book on Mathematics, New York 10. John B. Fraleigh, 1999; *A First Course in Abstract Algebra*; Fourth Edition; Addison-Wesley Publishing Company, Inc. 11. David S. Dummit, and Richard M. Foote, 1999, *Abstract Algebra*, 3rd Ed., John Wiley and Sons, Inc., New York 12. D.S. Malik, John M. Mordeson, and M.K. Sen, 1998, *Fundamental of Abstract*, Fourth Edition, Addison-Wesley Publishing Company, Inc. 13. I. N. Herstein, 1975, *Topics in Algebra,* John Wiley and Sons Inc., New York

PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
CO 1			v			v			v

CO 2			v			v			v
CO 3			v			v			v
CO 4			v			v			v
CO 5			v			v			v