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MODULE HANDBOOK

Module name	Coding Theory
Module level, if applicable	Master
Code, if applicable	MMM 6207
Subtitle, if applicable	
Courses, if applicable	Coding Theory
Semester(s) in which the module is taught	2
Person responsible for the module	Algebra Research Group
Lecturer(s)	Dr. Al. Sutjijana, M.Sc. Dr. rer. nat. Indah Emiliana, M.Si. Dr. Budi Surodjo, M.S.
Language	Bahasa Indonesia
Relation to curriculum	Master Degree, Elective Course
Teaching methods	Lecture, discussion, presentations, homework etc.
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 Credits
Requirements according to the examination regulations	Students have an examination card where the course is stated on.
Recommended prerequisites	Students should be proficient in linear algebra, intro. to ring and group theories.
Module objectives/intended learning outcomes	After completing this course the students should have: CO 1. ability to prove the fundamental properties in coding theory such as encoding, decoding, field, polynomials rings, finite fields. CO 2. ability to find a generator matrix and a parity-check matrix of a linear code. CO 3. ability to encode and decode linear codes (standard array decoding, syndrome decoding) and some special linear codes, such as self- dual codes, and cyclic codes, BCH Codes, Reed Solomon Codes, Goppa Codes. CO 4. abiliy to do further studies and research in coding theory
Content	a. Introduction, basic theory and some over view of applications of Error Correcting Codes, Communication channels, maximum likelihood decoding, Hamming distance, nearest neighbor decoding, distance of a code. b. Fields, Polynomials rings, structure of finite fields, minimal polynomials. c. Linear Codes, Hamming weight, bases for linear code, Generator matrix and parity check matrix, equivalence code, encoding and decoding of linear code, cosets, nearest neighbor decoding, syndrome decoding. d. Cyclic Codes, BCH Codes, Reed Solomon Codes, Goppa Codes.
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 25-40% 2. Mid-Term Examination 25-40% 3. Quiz/Presentation, Homework 20-30% To pass this course, the minimum grade is C.
Media employed	White/Black Board, LCD Projector, Laptop/Computer, Zoom, E-Learning, Simaster

Reading List	1. San Ling and Chaoping Xing, 2004, *Coding Theory A First Course*, Cambridge University Press. 2. J¨urgen Bierbrauer, 2017, *Introduction to Coding Theory*, CRC PressTaylor & Francis Group 3. Scott A. Vanstone, Paul C van Oorschot, P.C.V., 1989, *An Introduction to Error Correcting Codes with Application*, Kluwer Academic Publishers

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						
CO 3		v	v	v	v				
CO 4	v	v	v	v		v			

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