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MODULE HANDBOOK

Module name	Introduction to Coding Theory
Module level, if applicable	Bachelor
Code, if applicable	MMM-3206
Subtitle, if applicable	-
Courses, if applicable	Introduction to Coding Theory
Semester(s) in which the module is taught	5th (fifth)
Person responsible for the module	Chair of the Lab. Algebra
Lecturer(s)	Dr. Al. Sutjijana, M.Sc. Dr.rer.nat. Indah Emiliana Wijayanti, M.Si. Dr. Budi Surodjo, M.S.
Language	Bahasa Indonesia
Relation to curriculum	Bachelor Degree, Elective Course, 5th semester
Type of teaching, contact hours	150 minutes lectures, 180 minutes structured activities per week.
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures 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 Coding Theory course (MMM-3206) and have an examination card where the course is stated on.
Recommended prerequisites	Students have taken Linear Algebra course (MMM-2202) and have participated in the final examination of the course.
Module objectives/intended learning outcomes	After completing this course, the students should have: CO 1. ability to prove the fundamental properties of coding theory such as encoding, decoding, block code, hamming distance, maximum likelihood decoding, and nearest neighbour/minimum distance decoding. CO 2. ability to construct finite fields, to prove its properties and to do calculation related to finite field. CO 3. ability to find a generator matrix and a parity-check matrix of a linear code. CO 4. ability to decode linear codes (standard array decoding, syndrome decoding) and some special linear codes, such self- dual code, and cyclic code.
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, Cyclic 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 — 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	White/Black Board, LCD Projector, Laptop/Computer
Reading List	1. Andre Neubauer, Jurgen Freudenberger, Volker Kuehn, 2007, *Coding Theory: Algorithms, Architectures, and Applications*, John Wiley and Sons. 2. Ron M. Roth, 2006, *Introduction to Coding Theory*, Cambridge University Press. 3. San Ling and Chaoping Xing, 2004, *Coding Theory A First Course*, Cambridge University Press. 4. Raymond Hill, 1990, A First Course in Coding Theory, Oxford University Press. 5. 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		v
CO 2		v			v				
CO 3		v			v	v			
CO 4		v			v	v			