UNDERGRADUATE PROGRAM IN COMPUTER SCIENCE
DEPARTMENT OF COMPUTER ENGINEERING
FACULTY OF INTELLIGENT ELECTRICAL AND INFORMATICS TECHNOLOGY

Module name	**Linear Algebra and Discrete Mathematics**	
Module level	Undergraduate	
Code	EC184301	
Courses (if applicable)	Linear Algebra and Discrete Mathematics	
Semester	3 / Fall (Gasal)	
Contact person	Susi Juniastuti, S.T, M.Eng.	
Lecturer	Susi Juniastuti, S.T, M.Eng.	
Language	[Indonesia / English]	
Relation to curriculum	Undergraduate degree program, mandatory, 3rd semester. {semester}	
Type of teaching, contact hours	Lecture, < 60 students, 170 Minute 4 SKS	
Workload	1. Lectures: 4 x 50 = 200 minutes (3.3 hours) per week. 2. Exercises and Assignments: 4 x 60 = 240 minutes (4 hours) per week. 3. Private study: 4 x 60 = 240 minutes (4 hours) per week.	
Credit points	4 credit points (sks).	
Requirements according to the examination regulations	A student must have attended at least 75% of the lectures to sit in the exams.	
Mandatory prerequisites	Mathematics I, Mathematics II	
Learning outcomes and their corresponding PLOs	CLO-1 Students are able to explain and apply the concept of linear equation systems for solving problems in engineering	PLO-3 PLO-5
	CLO-2 Students are able to explain and apply the concept of matrices and vectors for solving problems in engineering.	PLO-3 PLO-5
	CLO-3 Students are able to explain and apply the concept of linear transformation and orthogonality to solve problems in engineering	PLO-3 PLO-5
	CLO-4 Students are able to explain and apply eigenvalue and eigenvector concepts to solve problems in engineering.	PLO-3 PLO-5
	CLO-5 Students are able to design and implement linear algebra concepts for specific cases.	PLO-3 PLO-5
	CLO-6 Students are able to formulate logical sentences and determine truth by logical inference.	PLO-3 PLO-5

	CLO-7 Students are able to formulate sets, inter-set functions, and algorithm complexities.	PLO-3 PLO-5
	CLO-8 Students are able to prove a sequence or series model using mathematical induction.	PLO-3 PLO-5
	CLO-9 Students are able to understand the principles of number theory and solve simple cryptographic problems.	PLO-3 PLO-5
	CLO-10 Students are able to formulate graph theory and solve simple graph problems.	PLO-3 PLO-5
Content	In this course, students will learn about linear algebra, vector, and matrix theories. Topics include linear equations, matrices, vector spaces, linear transformations, scalar products, orthogonality, eigenvalue, eigenvectors, and applications using linear algebraic foundations as its solution. Students then will learn about discrete mathematics and its application in engineering. Some of the main subjects studied include sets, functions, algorithm complexity, mathematical inductions, number theory, relationships, and graph theory. The learning methods used in the course are lectures, discussions, case studies, quizzes, practice questions, and examinations.	
Study and examination requirements and forms of examination	• In-class exercises • Quiz 1 and 2 • Assignment 1, 2, 3 • Mid-term examination • Final examination	
Media employed	LCD, whiteboard, websites (myITS Classroom).	
Assessments and Evaluation	CO-1: Question no 1 in midterm exam (10%) CO-2: Question no 2 in midterm exam (10%) CO-3: Question no 3 in midterm exam (10%), quiz 1 (5%) CO-4: Assignment 1 (5%), question no 4 in midterm exam (10%), Quiz 2 (5%) CO-5: Question no 1 in final exam (10%), question no 2 in final exam (10%) CO-6: Assignment 2 (5%), question no 3 in final exam (10%) CO-7: Assignment 3 (5%), question no 4 in final exam (5%) CO-8: Question no 3 in final exam (5%) CO-9: Question no 4 in final exam (5%) CO-10: Question no 5 in final exam (5%)	
Reading List	1. David C. Lay. “Linear Algebra and its applications”, Pearson Education, 4th edition. 2. Kreyszig, E, “Advanced Engineering Mathematics”, 10th edition, John Wiley & Sons, Singapore, 2011. 3. Kenneth H. Rosen, “Discrete Mathematics and Its Applications”, McGraw-Hill Science/Engineering/Math; 5 edition, 2003.	