ITS
Institut
Teknologi
Sepuluh Nopember

Mathematics

DESCRIPTION OF COURSE UNIT

Program Studi Sarjana (S1) Desain Produk

Bachelor of Industrial Design (BOID)

2018-2023

Gedung Desain Produk ITS Jl. Despro No.1 Kampus ITS Sukolilo Surabaya. 60111
Hotline Call official : +623115931147 email : despro@its.ac.id

Description of Course Unit
according to the ECTS User's Guide 2015

Course unit title	Mathematics
Course unit code	KM184101
Type of course unit	compulsory
Level of course unit	first cycle Bachelor
Year of study when the course unit is delivered	1st year
Semester/trimester when the course unit is delivered	2st Semester
Number of ECTS credits allocated	4,8 Credits
Name of lecturer	Dr. Tahiyatul Asfihani, S.Si., M.Si.
Learning outcomes of the course unit	1. Able to interpret basic mathematical concepts and prepare proofs directly, indirectly, or by mathematical induction. 2. Able to identify simple problems, form mathematical models and solve them. 3. Master standard methods in mathematics. 4. Able to master fundamental mathematical theory which includes the concepts of matrices, determinants, complex numbers and equations or inequalities, as well as functions, derivatives, and integrals. 5. Able to identify and solve problems, form mathematical models and solve them.
Mode of delivery (face-to-face, distance learning)	face-to-face
Prerequisites and co-requisites	-
Course content	1. Matrix and Determinants. 2. Equations, inequalities, graphs of functions of parabolas, circles or ellipses. 3. Complex numbers and their polar forms. 4. Continuity of Functions and their derivatives. 5. Integrals and Fundamental theorems of Calculus.
Recommended or required reading and other learning resources/tools	1. Tim Dosen Jurusan Matematika ITS, Buku Ajar Kalkulus 1 , Edisi ke-4 Jurusan Matematika ITS, 2018 2. Anton, H. dkk, Calculus, 10-th edition, John Wiley & Sons, New York, 2012. 3. Kreyzig, E, Advanced EngineeringMathematics, 10-th edition, John Wiley & Sons, Singapore, 2011.

	4. Purcell, J, E, Rigdon, S., E., Calculus, 9-th edition, Prentice-Hall, New Jersey, 2006. 5. James Stewart , Calculus, ed.7, Brooks/cole-Cengage Learning, Canada,2012. 6. Strogatz, Steven. 2013. The Joy Of X: A Guided Tour of Math, from One to Infinity. New York : Mariner Books. 7. Budhi,Wono Setya.2001.Kalkulus Peubah banyak dan Penggunaanya.Bandung:ITB. 8. Graham, Alexander. 2018. Kronecker Products and Matrix Calculus with Applications. Dover Publications. 9. Ayes,Frank dan Elliot Mendelson.2004.Kalkulus Lanjut Edisi Keempat.Jakarta:Erlangga. 1988.Calculus (2nd edition).New York:WB Saunders,
Planned learning activities and teaching methods	Lectures, Tutorial activities, exercises
Language of instruction	Indonesia and English
Assessment methods and criteria	Assignment, Group Project, Quiz, Midterm Exam and Final Exam

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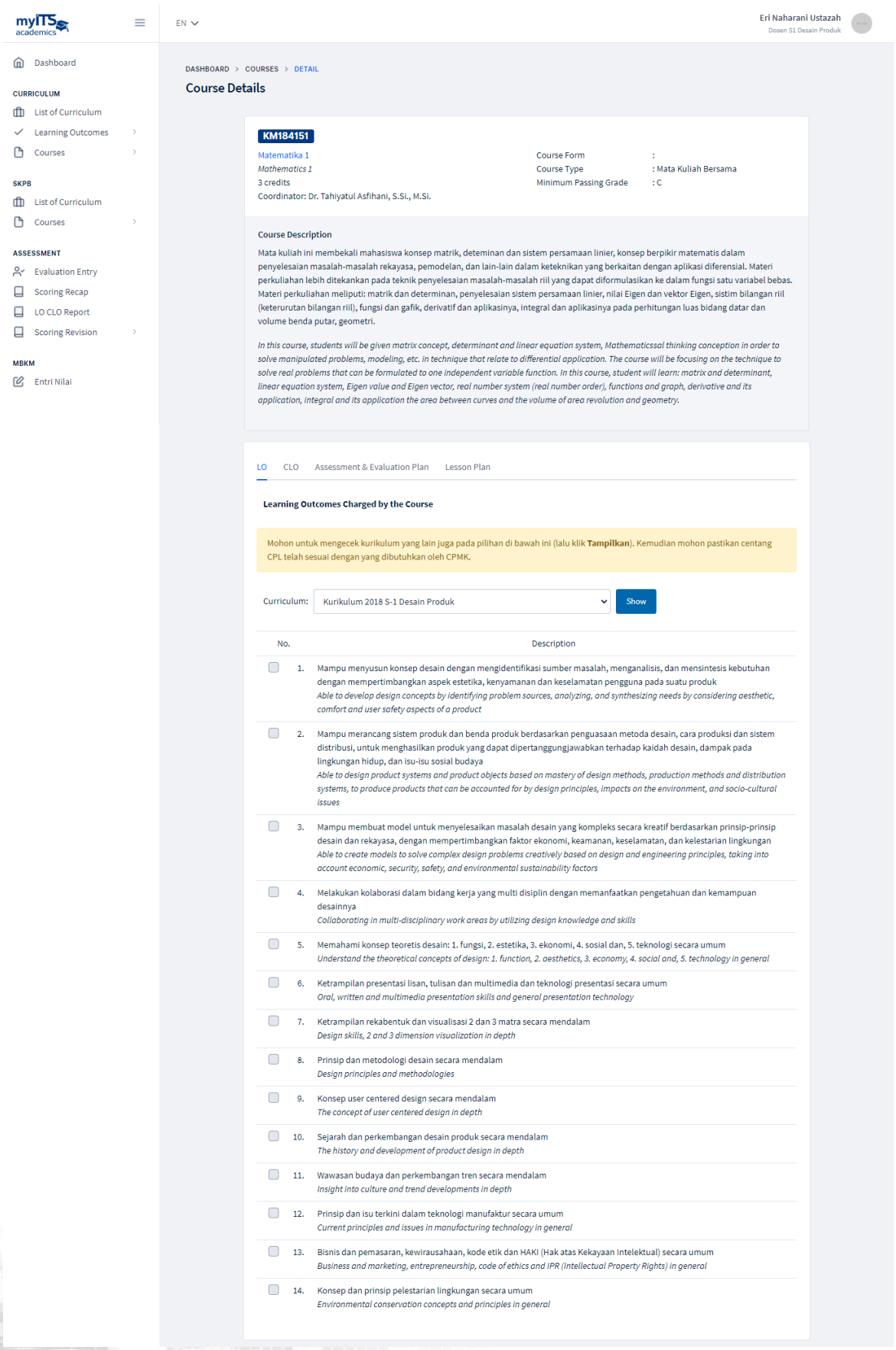

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Course Details

KM184151

Matematika 1
Mathematics 1
3 credits
Coordinator: Dr. Tahiyatul Asfihani, S.Si., M.Si.

Course Form :
Course Type : Mata Kuliah Bersama
Minimum Passing Grade : C

Course Description

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LO | CLO | Assessment & Evaluation Plan | Lesson Plan

Course Learning Outcomes

Mohon untuk mengecek kurikulum yang lain juga pada pilihan di bawah ini (lalu klik **Tampilkan**). Kemudian mohon pastikan centang CPL telah sesuai dengan yang dibutuhkan oleh CPMK.

Curriculum: Kurikulum 2018 S-1 Desain Produk — Show

Code	Description of CLO	Mapping of CLO to LO	Weight of CLO
CLO-1	Mampu memahami matriks dan determinan serta sifat-sifatnya dan mampu menyelesaikan sistem persamaan linier, menetukan nilai Eigen dan vektor Eigen. *Students are able to understand matrix and determinant with its characteristic and able to solve linear equation system.*		15%
CLO-2	Mampu memaham pengertian sistem bilangan riil, bentuk desimal bilangan riil, persamaan, dan pertidaksamaan. *Students are able to understand real number system, decimal form of real number, equality, and inequality.*		10%
CLO-3	Mampu memahami fungsi polinomial, fungsi transenden, dan mampu menggambar grafiknya dasar. *Students are able to understand polynomial functions, trancendent functions, and able to draw the basic graph.*		10%
CLO-4	Mampu mendefinisikan sinus, cosines, tangent, dan megaplikasikan kesamaan trigonometri dalam menyederhanakan/menyelesaikaan persamaan trigonometri. *Students are able to define sinus, cosinus, tangent, and apply trigonometric equation in simplifying /solving trigonometric equation.*		10%
CLO-5	Mampu menurunkan (mendiferensialkan) fungsi explisit, menerapkan aturan rantai, turunan fungsi implisit serta mampu menentukan nilai maks/min untuk fungsi polynomial. *Students are able to differentiate explicit functions, apply chain rule, derivative implicit functions, and able to determine maximum/minimum value of the polynomial function.*		15%
CLO-6	Mampu menyelesaikan integral menggunakan teorema fundamental kalkulus dan rumus rumus dasar integrasi. *Students are able to solve integral using fundamental calculus theorem and basic integration equation.*		15%
CLO-7	Mampu menghitung luas bidang datar dan volume benda putar. *Students are able to calculate the area between curves and the volume of area revolution.*		15%
CLO-8	Mampu memahami geometri. *Students are able to understand geometry.*		10%
	Total Weight		**100%**

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Assessment & Evaluation Plan

No.	Evaluation Plan	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5	CLO-6	CLO-7	CLO-8	Total Weight
1	Tugas, keaftifan & dsb *Task, interaction & etc* Kognitif - Tugas | *Cognitive - Assignment*	5%	0%	0%	0%	0%	5%	10%	0%	20%
2	Quis 1 *Quiz 1* Kognitif - Quiz | *Cognitive - Quiz*	5%	5%	5%	0%	0%	0%	0%	0%	15%
3	Quis 2 *Quiz 2* Kognitif - Quiz | *Cognitive - Quiz*	0%	0%	0%	0%	5%	5%	0%	5%	15%
4	ETS *MidExam* Kognitif - UTS | *Cognitive - Midterm Exam*	5%	5%	5%	10%	0%	0%	0%	0%	25%
5	UAS *FinalExam* Kognitif - UAS | *Cognitive - Final Exam*	0%	0%	0%	0%	10%	5%	5%	5%	25%
	TOTAL *Target*	**15%** *15%*	**10%** *10%*	**10%** *10%*	**10%** *10%*	**15%** *15%*	**15%** *15%*	**15%** *15%*	**10%** *10%*	**100%** *100%*

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LO CLO Assessment & Evaluation Plan Lesson Plan

Lesson Plan

Weeknum	Course Material	Learning Method
1	Matriks dan Determinan & Penyelesaian Sistem Persamaan Linier. *Matrix and Determinant & Solving Linear Equation System*	Non SCL
2	Nilai Eigen dan Vektor Eigen. *Eigen Value and Eigen Vector.*	Metode SCL lainnya
3	Sistem Bilangan Real, logaritma, nilai mutlak & pertidaksamaan. *Real Number System, logarithms, absolute value & inequalities.*	Non SCL
4	Koordinat bidang, garis, jarak dua titik, lingkaran & parabola. *The coordinates planes, lines, two points distance, circle & parabola.*	Case method
5	Fungsi dan operasi fungsi, fungsi polinomial & invers fungsi, *Property and operation functions, polynomial functions & inverse functions*	Non SCL
6	Fungsi transenden dan trgonometri & grafik fungsi. *Transcendent and trigonometry functions, graph functions.*	Metode SCL lainnya
7	Sinus, cosines, tangent, cotangent, secan, cosecan, persamaan trigonometri *Sinus, cosinus, tangent, cotangent, secan, cosecan, trigonometry equation.*	Non SCL
8	ETS *MIDTERM EXAM*	Non SCL
9	Limit fungsi & kontinuitas *Limit functions & continuity*	Non SCL
10	Turunan, aplikasi turunan. *The derivative, applications of derivatives.*	Case method
11	Integral tak tentu, integrasi dengan substitusi, integrasi parsial. *Improper integral, integration with substitution, partial*	Non SCL
12	Integrasi pecahan rasional, integrasi fungsi fungsi trigonometri, teknik integrasi yang lain. *Integration of rational functions, trigonometric functions integration, other integration technique.*	Metode SCL lainnya
13	Aplikasi integral tertentu: Luas antara dua kurva *Application of Integral: The area between curve*	Non SCL
14	Aplikasi integral tertentu: menghitung volume benda putar. *Application of Integral: The volume of area revolution.*	Case method
15	Irisan kerucut, pencerminan, pergeseran dan proyeksi. *Cone slice, mirroring, shifting, projection.*	Non SCL
16	EAS *FINAL EXAM*	Non SCL

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