MODULE HANDBOOK
MATHEMATICS 2

Module name	**Mathematics 2**	
Module level	Undergradute	
Code	KM184201	
Course (if applicable)	Mathematics 2	
Semester	Second Semester (Genap)	
Person responsible for the module	Dra. Rinurwati, M.Si.	
Lecturer	ITS Mathematics Lecturer Team	
Language	Bahasa Indonesia	
Relation to curriculum	Undergradute degree program, **mandatory**, 2nd semester.	
Type of teaching, contact hours	Presentation, <60 students	
Workload	1. Presentation : 3 x 50 = 150 minutes per week. 2. Exercises and Assignments : 2 x 60 = 120 minutes (2 hours) per week. 3. Private learning : 2 x 60 = 120 minutes (2 hours) per week.	
Credit points	3 credit points (sks)	
Requirements according to the examination regulations	A student must have attended at least 75% of the presentation to sit in the exams.	
Mandatory prerequisites	-	
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) after completing this module, CLO 1 Students are able to apply basic concept of mathematics related to transcendent functions CLO 2 Students are able to apply integration techniques CLO 3 Students are able to apply it in the form of Cartesian coordinate function, and polar coordinates and parametric equations CLO 4 Students are able to determine the convergence of infinite sequences and infinite series and the number of convergent infinite series CLO 5 Students are able to transform functions into Taylor series or the Mac Laurint series	 PLO 1,2,4 PLO 3 PLO 3,4,5 PLO 2,3,4 PLO 4,5
Content	In this course, students will study the following subjects:	

	1. Transcendent function, differential and integral. 2. Integral and improper integral. 3. Application of certain integral in a plane, volume of object, arc length and surface area, center of mass, application of Guldin theorem. 4. Polar coordinate systems and parametric equations, graphical sketches, and their applications. 5. Convergences of infinite sequences and series, and calculate the number of convergence infinite series, Taylor series or Mac Laurint series
Study and examination requirements and forms of examination	Independent Assignments, Written Exams (Quiz, ETS, EAS).
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom.
Reading list	Main : 1. Tim Dosen Jurusan Matematika ITS, Buku Ajar Kalkulus 2 , Edisi ke-4 Jurusan Matematika ITS, 2012 2. Anton, H. dkk, Calculus, 10-th edition, John Wiley & Sons, New York, 2012 Supporting : 1. Kreyzig, E, Advanced Engineering Mathematics, 10-th edition, John Wiley & Sons, Singapore, 2011 2. Purcell, J, E, Rigdon, S., E., Calculus, 9-th edition, Prentice-Hall, New Jersey, 2006 3. James Stewart , Calculus, ed.7, Brooks/cole-Cengage Learning, Canada,2012

I. Rencana Pembelajaran Semester / *Semester Learning Plan*

	INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS) **FACULTY OF INTELLIGENT ELECTRICAL AND INFORMATICS TECHNOLOGY** **DEPARTMENT OF BIOMEDICAL ENGINEERING**	**Document Code**

SEMESTER LEARNING PLAN

MATA KULIAH (MK) ***COURSE***	**KODE** ***CODE***	**Rumpun MK** ***Course Cluster***	**BOBOT (sks)** **Credits**		**SEMESTER**	**Tgl Penyusunan** ***Compilation Date***
Matematika 2 ***Mathematics 2***	KM184201	Ilmu Dasar Teknik *Basic Engineering*	T=3	P=0	II	15 Juli 2020 July 15th, 2020

OTORISASI / PENGESAHAN ***AUTHORIZATION / ENDORSEMENT***	**Dosen Pengembang RPS** ***Developer Lecturer of Semester Learning Plan***	**Koordinator RMK** ***Course Cluster Coordinator***	**Ka DEPARTEMEN** ***Head of Department***
	(Dra. Rinurwati, M.Si.)	**(Dimas Anton Asfani, ST., MT., Ph.D)**	**(Dedet Candra Riawan, ST., M.Eng., Ph.D.)**

Capaian Pembelajaran ***Learning Outcomes***	**CPL-PRODI yang dibebankan pada MK** ***PLO Program Charged to The Course***	
	CPL-01 *PLO-01*	Mampu menginterpertasikan konsep dasar matematika dan menyusun pembuktian secara langsung, tidak langsung, maupun dengan induksi matematika. *Able to interpret the basic concepts of mathematics and establish direct, indirect or induced mathematics proof*
	CPL-02 *PLO-02*	Mampu melakukan identifikasi permasalahan sederhana, membentuk model matematika dan menyelesaikannya *Able to identify simple problems, form mathematical models and solve them*
	CPL-03 *PLO-03*	Menguasai metode-metode standar dalam bidang matematika *Mastering standard methods in mathematics*
	CPL-04 *PLO-04*	Mampu menguasai teori fundamental matematika yang meliputi konsep himpunan, fungsi, diferensial, integral, ruang dan struktur matematika. *Able to master the fundamental theory of mathematics including the concepts of sets, functions, differentials, integrals, geometry and structure of mathematics.*
	CPL-05 *PLO-05*	Mampu melakukan identifikasi permasalahan, membentuk model matematika dan menyelesaikannya *Able to identify problems, form mathematical models and solve them*

<table>
<tr><td></td><td colspan="2">Capaian Pembelajaran Mata Kuliah (CPMK)
Course Learning Outcome (CLO) - If CLO as description capability of each Learning Stage in the course, then CLO = LLO</td></tr>
<tr><td></td><td>CP MK 1
CLO 1</td><td>Mahasiswa mampu menerapkan konsep-konsep Dasar Matematika yang terkait dengan fungsi transenden
Students are able to apply basic concept of mathematis related to transcendent functions</td></tr>
<tr><td></td><td>CP MK 2
CLO 2</td><td>Mahasiswa mampu menerapkan teknik integrasi
Students are able to apply integration techniques</td></tr>
<tr><td></td><td>CP MK 3
CLO 3</td><td>Mahasiswa mampu mengaplikasikannya baik dalam bentuk fungsi koordinat kartesius, maupun koordinat kutub dan persamaan parametrik
Students are able to apply it in the form of Cartesian coordinate function, and polar coordinates and parametric equations</td></tr>
<tr><td></td><td>CP MK 4
CLO 4</td><td>Mahasiswa mampu menentukan kekonvergenan barisan dan deret tak hingga dan jumlah deret tak hingga yang Konvergen
Students are able to determine the convergences of infinite sequence and infinite series and the number of convergent infinite series</td></tr>
<tr><td></td><td>CP MK 5
CLO 5</td><td>Mahasiswa mampu mentransformasikan fungsi ke dalam bentuk deret Taylor atau deret Mac Laurint
Students are able to transform functions into Taylor series or Mac Laurint series</td></tr>
<tr><td>Peta CPL – CP MK

Map of PLO - CLO</td><td colspan="2">
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<tr><td></td><td>CPL 1
PLO 1</td><td>CPL 2
PLO 2</td><td>CPL 3
PLO 3</td><td>CPL 4
PLO 4</td><td>CPL 5
PLO 5</td></tr>
<tr><td>CPMK 1
CLO 1</td><td>✓</td><td>✓</td><td></td><td>✓</td><td></td></tr>
<tr><td>CPMK 2
CLO 2</td><td></td><td></td><td>✓</td><td></td><td></td></tr>
<tr><td>CPMK 3
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<tr><td>CPMK 5
CLO 5</td><td></td><td></td><td></td><td>✓</td><td>✓</td></tr>
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<tr><td>Bahan Kajian</td><td colspan="2">Fungsi Transenden, diferensial dan integralnya
Teknik Integrasi, Integral tak wajar</td></tr>
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Course Materials:	Aplikasi Integral Fungsi bentuk Kutub, fungsi Parametrik, diferensial dan integralnya Barisan dan Deret *Transcendent functions, differential and integral* *Integration Technique, improper Integral* *Application of integral* *Polar form functions, Parametric functions, differential and integral* *Sequence and series*
Pokok Bahasan ***Subject***	Dalam Mata Kuliah ini mahasiswa akan mempelajari Pokok bahasan pokok bahasan sebagai berikut: 1. Fungsi Transenden, diferensial dan integralnya. 2. Teknik integrasi dan Integral tak wajar. 3. Aplikasikan integral tertentu pada luas bidang datar, volume benda, Panjang busur dan luas kulit benda putar, pusat massa, penerapan teorema Guldin. 4. Sistem koordinat kutub dan persamaan parametrik, sketsa grafiknya, dan aplikasinya. 5. Kekonvergenan barisan dan deret tak hingga, dan menghitung jumlah deret tak hingga yang konvergen, deret Taylor atau deret Mac Laurint *In this course students will study the following subjects:* *1. Transcendent function, differential and integral.* *2. Integration techniques and improper integral.* *3. Application of certain integral in plane, volume of object, length of arc and surface area, center of mass, application of Guldin theorem.* *4. Polar coordinate systems and parametric equations, graphical sketches, and their applications.* *5. Convergences of infinite sequences and series, and calcuating the number of convergent infinite series, Taylor series or Mac Laurint series*
Pustaka ***References***	**Utama / *Main*:** 1. Tim Dosen Jurusan Matematika ITS, Buku Ajar Kalkulus 2 , Edisi ke-4 Jurusan Matematika ITS, 2012 2. Anton, H. dkk, Calculus, 10-th edition, John Wiley & Sons, New York, 2012

	Pendukung / *Supporting*: 1. Kreyzig, E, Advanced Engineering Mathematics, 10-th edition, John Wiley & Sons, Singapore, 2011 2. Purcell, J, E, Rigdon, S., E., Calculus, 9-th edition, Prentice-Hall, New Jersey, 2006 3. James Stewart , Calculus, ed.7, Brooks/cole-Cengage Learning, Canada,2012
Dosen Pengampu ***Lecturers***	ITS Mathematics Team Lecturer
Matakuliah syarat ***Prerequisite***	-

Mg ke/ ***Week***	**Kemampuan akhir tiap tahapan belajar (Sub-CPMK) /** ***Final ability of each learning stage (LLO)***	**Penilaian /** ***Assessment***		**Bentuk Pembelajaran; Metode Pembelajaran; Penugasan Mahasiswa; [Estimasi Waktu] /** ***Form of Learning; Learning Method; Student Assignment; [Estimated Time]***		**Materi Pembelajaran [Pustaka] /** ***Learning Material [Reference]***	**Bobot Penilaian /*Assess-ment Load* (%)**
		Indikator / ***Indicator***	**Kriteria & Teknik /** ***Criteria & Techniques***				
(1)	**(2)**	**(3)**	**(4)**	**Tatap Muka /** ***In-class*** **(5)**	**Daring /** ***Online*** **(6)**	**(7)**	**(8)**
1	Pengantar Kuliah *Introduction*	**Menyampaikan RPS, Kontrak Kuliah, dan Perjanjian macam Evaluasi dan Prosentase masing masing evaluasi** ***Presenting SLP, study contracts, and agreement about evaluation and persentages of each evaluation***					*5*
	Mampu menjelaskan: Sifat-sifat fungsi dan grafik yang melibatkan logaritma, dan eksponensial *Able to explain:*	Ketepatan menjelaskan sifat2 log dan perpangkatan, mensketsa grafik dasar log & eksponensial *Accuracy in describing log and*	Ketajaman mensketsa Grafik log & eksponen. Soal-soal latihan serta tugas *Acuity in sketching graphic of Log & exponential*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 1.40 menit	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/ asinkronus di MyITS Classroom	Ihtisar sifat logaritma, eksponensial dan fungsi log & eksponensial [1] hal: 1-40 *Overview of logarithms properties, exponential and log & exponential functions*	

	The property of functions and graphs involving logarithms, and exponentials	*exponential properties, sketching basic graph of log & exponential*	*Exercises and assignments*	*Presentation, exercises and assignment* *Time: 1.40 minutes*	*Presentation, exercises and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	*[1] page: 1-40*	
2-3	Mampu menentukan turunan: fg invers trigonometri, Fungsi Hiperbolik & invers fs hiperbolik *Able to determine the derivative:* *fg inverse trigonometric, Hyperbolic Functions & fs inverse hyperbolic*	Ketepatan: Memperoleh Turunan, Invers fungsi transenden dan invers trigonometri dan sketsa Grafiknya *Accuracy:* *Obtain the Derivative, Inverse of transcendent function and inverse of trigonometric functions and sketching the Graphs*	Ketajaman Sketsa grafik dan inversnya, diferensiasi dan integrasinya Soal-soal latihan serta tugas *Sharpness of the sketched graph and its inverses, differentiation and integration* *Exercises and assignments*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 2 x 1.40 Menit *Presentation, exercises and assignment* *Time: 2x1.40 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/asinkronus di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	Grafik fs log & eks, fungsi invers trigonometri, turunan dan integralnya [1] hal: 4499 *Graph of fs log & ex, inverse functions of trigonometry, derivatives and its integrals* *[1] p: 4499*	**10**
4	**ASISTENSI KE 1** ***ASSISTANCE 1***						
5	**EVALUASI 1** ***1st EVALUATION***	**KUIS 1, bahan Bab 1** ***QUIZ 1, material in Chapter 1***	**Ketajaman menyelesaikan soal-soal yang terkait dengan materi Bab 1**	**TES TERTULIS** **Waktu: 60 menit** ***Written Test*** ***Time: 60 minutes***	**TES TERTULIS** **Waktu: 50 menit melalui MyITS Classroom** ***Written test***		

			Acuity in solving problems related to the material in Chapter 1		***Time: 50 minutes via MyITS Classroom***		
6	Mampu menyelesaikan Integral parsial dan integral fungsi trigonometri *Able to solve partial integrals and integral of trigonometric functions*	Ketepatan menyelesaikan integral: parsial dan fungsi trigonometri *Accuracy in solving integrals: partials and trigonometric functions*	Ketajaman menyelesaikan integral dengan metode Integral Parsial dan fungsi Trigonometri Soal-soal latihan serta tugas *Acuity in solving integrals using Partial Integral method and Trigonometric function* *Exercises and assignments*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 1.40 menit *Presentation, exercises and assignment* *Time: 1.40 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/asinkronus di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	Teknik Integrasi [1] hal: 107-125 *Integration Technique [1] page: 107-125*	**5**
7	Mampu menyelesaikan Integral fungsi rasional. Mampu pengaplikasikan Teknik teknik integral yang lain *Able to solve integral of rational functions.* *Able to apply other integral techniques*	Ketepatan menyelesaikan: Integral fungsi rasional Ketepatan subtitusi dalam menyelesaikan integral menuju bentuk integral fg invers trigonometri	Ketajaman menyelesaikan Integral fungsi rasional. Soal-soal latihan serta tugas Ketajaman mengaplikasikan Teknik teknik integral yang lain soal-soal latihan serta tugas	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 50 menit *Presentation, exercises and assignment* *Time: 50 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus /*	Teknik Integrasi [1] hal: 127-138 Teknik Integrasi [1] hal: 139-150 *Integration Technique [1] pp: 127-138* *Integration Technique [1] p: 139-150*	**5**

		Accuracy in completing: Integral of rational functions *The precision of the substitution in solving the integral into integral form of inverse trigonometry*	*Acuity in resolving Integral of rational functions.* *Exercises and assignment to measure acuity in applying other integration techniques* *Exercises and assignments*		*asynchronous in MyITS Classroom*		
8	**ASISTENSI KE 2** ***ASSISTANCE 2***						
9	Mampu menyelesaikan Limit bentuk tak tentu, Mampu menghitung Integral tak wajar *Able to solve indefinite form Limit,* *Able to calaculate improper Integral*	Ketepatan menghitung Limit bentuk tak tentu & Integral tak wajar *Accuracy in calculating indefinite form Limit & improper integral*	Ketajaman menghitung Limit bentuk tak tentu & Integral tak wajar soal-soal latihan serta tugas *Acuity in calculating indefinite form Limit & improper integral* *exercisess and assignments*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 1.40 menit *Presentation, exercises and assignment* *Time: 1.40 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/asinkronus di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	Limit bentuk tak tentu & Integral tak wajar [1] hal: 171-180 *indefinite form Limit & improper Integral* *[1] pp: 171-180*	**10**
10	EVALUASI 2 *EVALUATION 2*	Kuis 2, Bahan Bab 2 dan 3	Ketajaman menyelesaikan soal-soal yang terkait dengan materi Bab 2 dan 3	TES TERTULIS Waktu: 60 menit *Written test*	TES TERTULIS Waktu: 50 menit melalui MyITS Classroom		

		Quiz 2, Materials In Chapter 2 And 3	TES TERTULIS *Acuity in solving problems related to materials in Chapters 2 and 3* *WRITTEN TEST*	*Time: 60 minutes*	*Written test* *Time: 50 minutes via MyITS Classroom*		
11	Mampu menghitung Luas bidang datar *Able to calculate plane area*	Ketepatan menghitung Luas bidang datar *Accuracy in calculating the area of a plane*	Ketajaman menghitung Luas bidang datar Soal-soal latihan serta tugas *Acuity to calculates the area of plane* *Exercises and assignments*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 1.40 menit *Presentation, exercises and assignment* *Time: 1.40 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/asinkron us di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	Aplikasi integral [1] hal: 183-191 *Application of integral [1] pp: 183-191*	**5**
12	**ASISTENSI KE 3** **ASSISTANCE 3**						
13	Mampu menghitung volume benda putar dengan metode Cakram	Ketepatan menghitung volume benda putar metode cakram	Ketajaman menghitung volume benda putar soal-soal latihan serta tugas	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 50 menit	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/asinkron	Volume benda putar [1] hal: 192-203 Volume benda putar [1] hal: 204-211	**5**

	Mampu menghitung volume benda putar dengan metode Cincin Silinder *Able to calculate the volume of rotating objects using the disc method* *Able to calculate the volume of rotary objects using the Cylinder Ring method*	Ketepatan menghitung volume benda putar metode cincin silinder *The accuracy of calculating the volume of the disc rotating object* *The accuracy of calculating the volume of the rotary object with the cylinder ring method*	Ketajaman menghitung volume benda putar soal-soal latihan serta tugas *Sharpness calculates the volume of rotating objects for exercisess and assignments* *Sharpness calculates the volume of a rotating object* *exercisess and assignments*	*Presentation, exercises and assignment* *Time: 50 minutes*	us di MyITS Classroom *Presentation, exercisess and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	*Volume of rotary objects* *[1] page: 192-203* *Volume of rotary objects* *[1] p: 204-211*	
14	Mampu menghitung Panjang kurva dan luas permukaan benda putar *Able to calculate curve length and surface area of rotating objects*	Ketepatan menghitung Panjang kurva dan luas permukaan benda putar *Accuracy of calculating curve length and surface area of rotary object*	Ketajaman menghitung Panjang kurva dan Luas permukaan benda putar Soal-soal latihan serta tugas *Acuivity in calculating curve length and surface area of rotary object* *Exercises and assignments*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 1.40 menit *Presentation, exercisess and assignment* *Time: 1.40 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/asi nk ronus di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	Panjang kurva dan luas permukaan [1] hal: 211-220 *Curve length and surface area* *[1] p: 211-220*	**5**

15,16	EVALUASI KE 3 *EVALUATION 3*	UJIAN TENGAH SEMESTER *MID-TERM EXAM*	Ketajaman menyelesaikan soal-soal yang terkait dengan fungsi trensenden, teknik integrasi luas bidang dan volume benda putar TES TERTULIS *Acuity in solving problems related to the transendent function, integration technique for plane area and rotary object volume* *WRITTEN TEST*	TERJADWAL Ujian tertulis Waktu: 100 menit *Schedules* *Written test* *Time: 100 minutes*	TERJADWAL Daring asinkronus Waktu: 90 menit *Scheduled* *Online asynchronous* *Time: 90 minutes*	KOMPREHENSIF *Comprehensive*	
17,18	Mampu menentukan Pusat massa dan menerapkan dalil Guldin *Able to determine the center of mass and applying Guldin's theorem*	Ketepatan menerapkan dalil Guldin untuk menghitung pusat massa dan luas, Volume,panjang busur dan luas Kulit *Accuracy in applying Guldin's theorem to calculate the center of mass and area, volume, arc length and surface area*	Ketajaman menerapkan dalil pada aplikasi integral Soal-soal latihan serta tugas *Acuity in applying theorems for application of integral* *Exercises and assignment*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 2 x 1.40 menit *Presentation, exercises and assignment* *Time: 2x1.40 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/asinkronus di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	Pusat massa dan dalil Guldin [1] hal: 221-231 *Center of mass and Guldin's theorem [1]page: 221-231*	**10**

19	Mampu menggambar Grafik dalam koordinat kutub *Able to draw a graph in polar coordinate*	Ketepatan menggambar grafik fs bentuk kutub *Accuracy in drawing fs graph in polar form*	Ketajaman menggambar Grafik dalam koordinat kutub soal-soal latihan serta tugas *Acuity in drawing a graph in polar coordinate*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 1.40 menit *Presentation, exercises and assignment* *Time: 1.40 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas melalui melalui Sinkronus/asinkronus di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	Grafik fungsi dalam Koordinat kutub [1] hal: 233-252 *Graph of function in polar coordinate [1]page: 233-252*	**5**
20	**ASISTENSI KE 4** ***ASSISTANCE 4***						
21	Mampu Menghitung Luas dalam sistem koordinat Kutub *Able to calculate area in polar coordinate system*	Ketepatan menghitung luas dalam kutub *Accuracy in calculating area in polar*	Ketajaman menghitung Luas dalam koord kutub soal-soal latihan serta tugas *Acuity in calculating area in polar coordinate* *Exercises and assignment*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 1.40 menit *Presentation, exercises and assignment* *Time: 1.40 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/asinkronus di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus /*	Koordinat kutub [1] hal: 254-262 *Polar coordinate [1]page: 254-262*	**7,5**

					asynchronous in MyITS Classroom		
22	Mampu: - Menjelaskan fs parametrik, turunannya dan luas luasnya. - Menghitung panjang busur dalam koordinat kutub *Able to:* *-Explain fs parametric, its derivation and area* *- Calculate arc length in polar coordinate*	Ketepatan menghitung panjang busur dalam bentuk parametric dan bentuk kutub *Accuracy in calculating arc length in parametric and polar form*	Ketajaman menghitung panjang busur dan dalam koordinat kutub dan bentuk parametrik soal-soal latihan serta tugas *Acuity in calculating arc length in polar coordinate and parametric form*	Kuliah, latihan soalsoal serta memberikan soal tugas Waktu: 1.40 menit *Presentation, exercises and assignment* *Time: 1.40 minutes*	Kuliah, latihan soalsoal serta memberikan soal tugas melalui Sinkronus/asinkronus di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	Koordinat kutub [1] hal: 262-282 *Polar coordinate [1]page:262-282*	**7,5**
23	**ASISTENSI KE-5** ***ASSISTANCE 5***						
24	EVALUASI KE-4 EVALUATION 4	KUIS KE-3: Bahan Dalil Guldin dan Bab 5 QUIZ 3: Material of Guldin's theorem and chapter 5	Ketajaman menyelesaikan soal soal yang terkait Dalil Guldin & Bab 5 TES TERTULIS *Acuity in solving problems related to Guldin's theorem and chapter 5* *Written test*	TES TERTULIS Waktu: 60 menit *Written test* *Time: 60 minutes*	TES TERTULIS Waktu: 50 menit melalui MyITS Classroom *WRITTEN TEST* *Time: 50 minutes via MyITS Classroom*		

25	Mampu menjelaskan barisan, kekonvergenan deret takhingga dengan Uji konvergenan Deret. *Able to explain sequence, infinite series convergences using the test of series convergency*	Ketepatan menentukan kekonvergenan Barisan, menguji kekonvergenan Deret tak hingga dan menghitung jumlahnya *Accuracy in determining convergencies of sequence, intinite series convergency test and calculate its number*	Ketajaman : menguji kekonvergenan deret tak hingga dan menghitung jumlahnya soal-soal latihan serta tugas *Acuity in:* *Testing infinite series convergencies and calculating its nuber* *Exercises and assignment*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 1.40 menit *Presentation, exercises and assignment* *Time: 1.40 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/asinkronus di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	Barisan dan Deret Uji konvergensi deret tak hingga [1] hal: 285-307 *Sequence and series* *Infinite series convergency test* *[1]page: 285-307*	**10**
26	Mampu mentransformasikan fungsi ke dalam bentuk deret Taylor atau deret MacLaurint *Able to transform a function into Taylor series or Maclaurint series form*	Ketepatan mendapatkan deret Tayloy dan Mac Laurin dari fungsi kontinu *Accuracy in obtaining Taylor series and Mac Laurin series from a continue function*	Ketajaman mentransformasi kan fungsi ke dalam bentuk deret Polinomial soal-soal latihan serta tugas *Acuity in transforming a function into polinomial series form*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 1.40 menit *Presentation, exercisess and assignment* *Time: 1.40 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/asinkronus di MyITS Classroom *Presentation, exercisess and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	Deret Taylor dan Deret Mac Laurint [1] hal: 327-330 *Taylor series and Mac Laurint series* *[1]page: 327-330*	**5**

27	Diferensiasi dan integrasi deret pangkat *Differentiation and integration of power series*	Ketepatan mendeferensilkan dan integral deret pangkat *Accuracy in differentiating and integrating power series*	Ketajaman mendapatkan deret dan deret fungsi Logaritma. Soal-soal latihan serta tugas *Acuity in obtaining series and logarithm function series* *Exercises and assignment*	Kuliah, latihan soal-soal serta memberikan soal tugas Waktu: 1.40 menit *Presentation, exercisess and assignment* *Time: 1.40 minutes*	Kuliah, latihan soal-soal serta memberikan soal tugas melalui Sinkronus/asinkronus di MyITS Classroom *Presentation, exercises and provide assignment questions through Synchronus / asynchronous in MyITS Classroom*	Deret Taylor dan Deret Mac Laurint [1] hal: 352-362 *Taylor series and Mac Laurint series* *[1]page: 352-362*	**5**
28	**ASISTENSI KE 6** ***ASSISTANCE***						
29-32	EVALUASI KE-5 EVALUATION 5	UJIAN AKHIR SEMESTER FINAL-TERM EXAM	Ketajaman menyelesaikan soal-soal yang terkait dengan fungsi trensenden, teknik integrasi luas bidang dan volume benda putar TES TERTULIS *Acuity in solving problems related to transdecent function, integration technique for*	TERJADWAL Ujian tertulis Waktu: 100 menit *Scheduled* *Written test* *Time: 100 minutes*	TERJADWAL Daring asinkron us Waktu: 90 menit *SCHEDULED* *Online asyncrhonous* *Time: 90 minutes*	KOMPREHENSIF *COMPREHENSIVE*	**100**

			plane area and volume of rotary object				

TM=Tatap Muka, PT=Penugasan Terstuktur, BM=Belajar Mandiri.

FF = Face to Face, SA = Structured Assignment, SS = Self Study.

II. Rencana Asesmen & Evaluasi (RAE) / Assessment & Evaluation Plan

	ASSESSMENT & EVALUATION PLAN BACHELOR DEGREE PROGRAM OF BIOMEDICAL ENGINEERING - FTEIC ITS **Course : Mathematics 2**		**RA&E** Write Doc Code
Kode/*code*: KM184201	**Bobot sks/*credits* (T/P):** 3/0	**Rumpun MK:** Ilmu Dasar Teknik ***Course Cluster:*** *Basic Engineering*	Smt: II
OTORISASI ***AUTHORIZATION***	**Penyusun RA & E** ***Compiler A&EP*** Dra. Rinurwati, M.Si.	**Koordinator RMK** ***Course Cluster Coordinator*** Dimas Anton Asfani, ST., MT., Ph.D	**Ka DEP** ***Head of DEP*** Dedet Candra Riawan, ST., M.Eng., Ph.D.

Mg ke/ *Week* (1)	**Sub CP-MK / *Lesson Learning Outcomes (LLO)* (2)**	**Bentuk Asesmen (Penilaian) *Form of Assessment* (3)**	**Bobot / *Load* (%) (4)**
1	Pengantar Kuliah *Introduction*	Tidak ada penilaian *No assessment*	5
	Mampu menjelaskan: Sifat-sifat fungsi dan grafik yang melibatkan logaritma, dan eksponensial *Able to explain:* *The property of functions and graphs involving logarithms, and exponentials*	Menyelesaikan persoalan yang melibatkan sifat-sifat fungsi logaritma dan eksponensial dan menggambarkan grafiknya *Solving problems related to logarithm and exponentials properties and drawing its graph*	

2-3	Mampu menentukan turunan: fg invers trigonometri, Fungsi Hiperbolik & invers fs hiperbolik *Able to determine the derivative:* *fg inverse trigonometric, Hyperbolic Functions & fs inverse hyperbolic*	Mengerjakan tugas untuk menentukan turunan dari fungssi trigonometri dan fungsi hiperbolik *Doing assignment to determine the derivative of trigonometric and hyperbolic function*	10
5	**EVALUASI 1** ***1st EVALUATION***	Kuis Bab 1 *Quiz Chapter 1*	5
6	Mampu menyelesaikan Integral parsial dan integral fungsi trigonometri *Able to solve partial integrals and integral of trigonometric functions*	Melakukan perhitungan matematis dengan menerapkan Teknik integrasi yang telah dipelajari Doing mathematical calculation using integration technique	5
7	Mampu menyelesaikan Integral fungsi rasional. Mampu pengaplikasikan Teknik teknik integral yang lain *Able to solve integral of rational functions.* *Able to apply other integral techniques*	Mengerjakan soal integral fungsi rasional *Solving problems related to integral of rational functions*	5

9	Mampu menyelesaikan Limit bentuk tak tentu, Mampu menghitung Integral tak wajar *Able to solve indefinite form Limit,* *Able to calaculate improper Integral*	Menghitung limit bentuk tak tentu dan integral tak wajar *Calculate indefinite form of limit and improper integral*	10
10	EVALUASI 2 *EVALUATION 2*	Kuis Bab 2 dan Bab 3 *Quiz Chapter 2 and 3*	
11	Mampu menghitung Luas bidang datar *Able to calculate plane area*	Mengerjakan soal terkait perhitungan luas bidang datar dengan menerapkan Teknik integrasi *Solving problems related to area of a plane using integration technique*	5
13	Mampu menghitung volume benda putar dengan metode Cakram Mampu menghitung volume benda putar dengan metode Cincin Silinder *Able to calculate the volume of rotating objects using the disc method* *Able to calculate the volume of rotary objects using the Cylinder Ring method*	Menggunakan Teknik integrasi untuk menghitung volume benda putar *Using integration technique to calculate volume of rotary object*	5
14	Mampu menghitung Panjang kurva dan luas permukaan benda putar *Able to calculate curve length and surface area of rotating objects*	Menggunakan Teknik integrasi untuk menghitung Panjang kurva dan luas permukaan benda putar *Using integration technique to calculate curve length and surface area of rotating object*	5
15-16	EVALUASI KE 3	**Evaluasi Tengah Semester**	

	EVALUATION 3	**Mid-Term Exam**	
17-18	Mampu menentukan Pusat massa dan menerapkan dalil Guldin *Able to determine the center of mass and applying Guldin's theorem*	Aplikasi dalil Guldin untuk menentukan pusat massa *Application of Guldin theorem to determine center of mass*	10
19	Mampu menggambar Grafik dalam koordinat kutub *Able to draw a graph in polar coordinate*	Menggambarkan grafik dalam koordinat kutub *Drawing a graph in polar coordinate*	5
20	**ASISTENSI KE 4** ***ASSISTANCE 4***		
21	Mampu Menghitung Luas dalam sistem koordinat Kutub *Able to calculate area in polar coordinate system*	Memberikan tugas untuk menghitung luas dalam sistem koordinat kutub *Giving assignment to calculate area in polar coordinate system*	7,5
22	Mampu: - Menjelaskan fs parametrik, turunannya dan luas luasnya. - Menghitung panjang busur dalam koordinat kutub *Able to:* *-Explain fs parametric, its derivation and area* *- Calculate arc length in polar coordinate*	Mengerjakan Latihan untuk mengukur Panjang busur dalam koordinat kutub *Doing exercises to calculate arc length in polar coordinate*	7,5
23	**ASISTENSI KE-5**		

	ASSISTANCE 5		
24	EVALUASI KE-4 *EVALUATION 4*	**Kuis 3** **Bahan Dalil Guldin dan Bab 5** ***Quiz 3*** ***Material Guldin theorem and Chapter 5***	
25	Mampu menjelaskan barisan, kekonvergenan deret tak hingga dengan Uji konvergenan Deret. *Able to explain sequence, infinite series convergences using the test of series convergency*	Mengerjakan tugas berkaitan dengan barisan dan deret *Doing assignment related to sequence and series*	10
26	Mampu mentransformasikan fungsi ke dalam bentuk deret Taylor atau deret MacLaurint *Able to transform a function into Taylor series or Maclaurint series form*	Mengerjakan Latihan soal untuk mentransformasikan fungsi kedalam bentuk deret Taylor *Doing exercises to transform a function into Taylor series form*	5
27	Diferensiasi dan integrasi deret pangkat *Differentiation and integration of power series*	Mengerjakan soal terkait integrasi deret pangkat *Solving problem related to integration of power series*	5
28	**ASISTENSI KE 6** ***ASSISTANCE***		
29-32	EVALUASI KE-5 *EVALUATION 5*	**Evaluasi Akhir Semester** ***Final-Term Exam***	
		Total bobot penilaian ***Total assessment load***	

CPL yang dibebankan pada MK / *PLO charged to the course*	**CPMK / *Course Learning Outcome (CLO)***	**Minggu ke / *Week***	**Bentuk Asesmen / *Form of Assessment***	**Bobot / *Load* (%)**
CPL-01 / *PLO-01*	CPMK 1 / *CLO 1*	*Week- 5-6*	*Task 1 stage 2*	12
		Week- 8	*Mid Exam Question 2 and 3*	18
CPL-02 / *PLO-02*	CPMK 1 / *CLO 1*	*Week- 10*	*Task 2*	5
	CPMK 4 / *CLO 4*	*Week- 16*	*Final Exam Question 1 and 2*	16
CPL-03 / *PLO-03*	CPMK 2 / *CLO 2*	*Week- 1*	*Task 1 stage 1*	4
	CPMK 3 / *CLO 3*	*Week- 2*	*Task 1 stage 1*	4
	CPMK 4 / *CLO 4*	*Week- 8*	*Mid Exam Question 1*	12
CPL-04 / PLO-04	CPMK 5 / *CLO 5*	*Week- 12*	*Task 3*	5
		Week- 16	*Final Exam Question 3*	12
CPL-05 / PLO-05	CPMK 6 / *CLO 6*	*Week- 16*	*Final Exam Question 4*	12
				∑ = 100%

No	***Form of Assessment***	***PLO-01***	***PLO-02***	***PLO-03***	***PLO-04***	***PLO-05***	***PLO-06***	***PLO-07***	***PLO-08***	***PLO-09***	***PLO-10***	***PLO-11***	***PLO-12***	***Total***
1	*Task 1*	0.06	0.06	0.03	0.05									**0.2**
2	*Task 2*	0.05												**0.05**
3	*Task 3*					0.05								**0.05**
4	*Mid Exam*	0.08	0.1	0.09		0.03								**0.3**
5	*Final Exam*	0.09	0.3	0.15	0.09	0.4								**0.4**
	Total	0.28	0.46	0.27	0.14	0.48								**1**