JURUSAN PENDIDIKAN MATEMATIKA
FPMIPA - UNIVERSITAS PENDIDIKAN INDONESIA

SATUAN ACARA PERKULIAHAN
SUBJECT : COMPLEX FUNCTION (3 SKS)
CODE : MAT 516

WEEK	TOPIC AND SUB-TOPIC	TUJUAN INSTRUKSIONAL UMUM (TIU)	TUJUAN INSTRUKSIONAL KHUSUS(TIK)	FOCUS	METHOD	MEDIA	TEST	REFERENCE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	1. Complex Number 1.1 Complex Numeric System 1.2 Complex Number Geometry	Students understand deeply the complex number definition and theorems, and also able to implement it in problem solving.	Students are able to define complex number. Students are able to proof the field characteristics of complex numeric system. Students are able to proof conjugate operation. Students are able to define argument and modulus of complex number. Students are able to proof modulus characteristics	- Complex number definition - Field characteristics of complex number - Conjugate operation - Argument and modulus of complex number - Modulus characteristics	Expository, discussion, combination, deductive, inductive and giving tasks.	Books and OHP	Tests are given to measure students competency in this subject. Tests are given twice through UTS (mid-term test) and UAS (end-term test)	Churchill, R.V., 1990. *Complex Variables And Applications, Fifth Edition*. New York: Mc. Graw-Hill Publishing Comp. Paliouras, J.D., 1975. *Complex Variables for Scientists and Engineers*. New York: Macmillan Publishing Co. Inc. Soemantri,R.,1994. *Fungsi Variabel Kompleks.* Depdik-bud Dikjen Pendi-dikan Tinggi Proyek Penulisan dan Peningkatan Mutu Tenaga Kependidkan.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2	1.3 Complex number roots. 2. Complex Function 2.1 Complex Function	Students understand deeply the complex number definition and theorems, and also able to implement it in problem solving.	Students are able to proof De Moivre theorem Students are able to define n root square of complex number. Students are able to define complex function. Students are able to define operation on complex function. Students are able to define composite function.	- De Moivre Theorem - n root square of complex number - Definition of complex function - Operation on complex function - Composite Function				
3	2.2 Elementary Function		Students are able to define linear function, reverse function, bilinear function, exponential function and logarithmic function. Students are able to proof exponential and logarithmic characteristics. Students are able to solve exponential and logarithmic equation.	- Linear function - Reverse function - Bilinear function - Exponential function - Logarithmic function				

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
4			Students are able to define trigonometry and hyperbolic function. Students are able to trigonometry and hyperbolic characteristics. Students are able to solve trigonometry and hyperbolic equation.	- Trigonometry function - Hyperbolic function				
5	3. Elementary Transformation 3.1 Linear transformation 3.2 Reverse transformation	Students are able to understand deeply the transformation definition and theorems and able to implement it in problem solving.	Students are able to define linear transformation geometry. Students are able to determine rotation transformation matrix. Students are able to define reverse transformation geometry Students are able to determine straight line and circle map by reverse transformation.	- Linear transformation geometry definition - Rotation transformation matrix - Reverse transformation geometry definition - Straight line and circle map by reverse transformation				

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6	3.3 Bilinear Transformation 4. Analytical Function 4.1 Main concept of Topology in Complex Field.	Students are able to understand deeply the definition and theorems of analytical function and able to implement it in problem solving.	Students are able to define bilinear transformation geometry. Students are able to determine linear and bilinear transformation function. Students are able to define area, open set, closed set, limit point set, and also interior and exterior of a complex set.	- Bilinear transformation geometry definition - Determine linear and bilinear transformation function - Definition of area, open set, closed set, limit point set, and also interior and exterior of a complex set				
7	4.2 Limit Function		Students are able to define limit function of a point. Students are able to define limit function of an area. Students are able to define limit function characteristics.	- Limit function definition - Limit function characteristics				
8	MID-TERM TEST							

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
9	4.3 Function continuity		Students are able to proof the theorem to calculate limit of complex function Students are able to define function continuity of a point Students are able to define function continuity of a region Students are able to proof function continuity of summary, multiplication, and division of two complex function on a region. Students are able to proof composite function continuity on a region. Students are able to proof polynomial function continuity and rational function continuity	- Theorem to calculate limit of complex function - Function continuity definition - Continuity of summary, multiplication, and division of complex function - Composite function continuity - Polynomial function continuity and rational function continuity				

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
10	4.4 Complex function derivative.		Students are able to define complex function derivative. Students are able to proof derivative function rules of algebra operations on two functions Students are able to proof complex function derivative characteristics. Students are able to proof complex function derivative.	- Definition of complex function derivative - Function rules of algebra operations on two functions - Complex function derivative characteristics - Composite function derivative.				
11	4.5 Cauchy Riemann Equation.		Students are able to proof obligatory and adequate terms of complex function derivative	- Obligatory and adequate terms of complex function derivative				
12	4.6 Analytical Function		Students are able to define analytical function on a region. Students are able to define singular point Students are able to proof the relation of Cauchy Reimann theorem and the analytical of a function.	- Analytical function definition - Singular point definition - Relation of Cauchy Reimann theorem and the analytical of a function				

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			Students are able to define harmonic function. Students are able to construct an analytic function.	- Harmonic function				
13	5. Complex Integration. 5.1 Complex Integral	Students are able to deeply understand the definition of comlex integral and its theorems, and also able to implement it in problem solving,	Students are able to define curve, flawless curve, orbit, simple closed curve, complicated closed curve, and orientation of simple closed curve. Students are able to construct complex integral. Students are able to proof the existence of integral complex. Student are able to proof the characteristics of complex integral.	- Definition of curve, flawless curve, orbit, simple closed curve, complicated closed curve, and orientation of simple closed curve. - Construction of complex integral - Existence of complex integral - Complex integral characteristic				

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
14	5.2 Cauchy Integral		Students are able to proof Cauchy theorem Students are able to proof Cauchy Goursat Theorem Students are able to proof the extension of Cauchy Goursat Theorem Students are able to proof first base complex integral theorem. Students are able to proof second base complex integral theorem.	- Teorema Cauchy - Cauchy Goursat Theorem - Extension of Cauchy Goursat Theorem - First base complex integral theorem - Second base complex integral theorem				
15	5.4 Annulus		Students are able to define annulus between two simple closed orbit Students are able to proof Annulus Theorem Students are able to proof the extension of Annulus Theorem Students are able to proof integral Cauchy equation	- Definition of annulus between two simple closed orbit - Annulus Theorem - Extension of Annulus Theorem - Integral Cauchy equation				
16	END-TERM TEST							