Textbook:

- Complex Analysis (3rd edition) by Lars V. Ahlfors (McGraw-Hill)

References:

- Complex Analysis (3rd edition) by Joseph Bak, Donald J. Newman (Springer)
- Real and Complex Analysis (3rd edition) by Walter Rudin (McGraw-Hill)

Prerequisite: Linear Algebra, Advanced Calculus

Course Website: https://moodle.ncku.edu.tw/

	Sections	**Topic**
Week 1 2/19, 2/21	1.1	Algebra of complex numbers
	1.2	Geometry of complex numbers, roots of unity, stereographic projection
Week 2 2/26	2.1 (pp. 21-28)	Differentiable functions, Cauchy-Riemann equations
Week 3 3/4, 3/6	2.1 (pp. 28-33)	Examples: polynomials, rational functions
	2.2 (pp. 33-42)	Power series, convergence theorems
Week 4 3/11, 3/13	2.3 (pp. 42-45)	Exponential and trig functions
	2.3.4 (pp. 46-47)	Logarithms, multivalued functions, intro to Riemann surfaces
Week 5 3/18, 3/20	3.1.1-3.1.4 (pp 49-62)	Fundamentals of metric spaces
	3.1.5, 3.1.6 (pp. 63-67)	Continuous functions, topological spaces
Week 6 3/25, 3/27	4.1.1-4.1.3 (pp. 101-108)	Line integrals
	4.1.4-4.1.4 (pp. 109-112)	Cauchy's theorem on rectangles
Week 7 4/1, 4/3	4.1.5 (pp. 112-114)	Cauchy's theorem on disks
	4.2.1, 4.2.2 (pp. 114-120)	Cauchy's integral formula
Week 8 4/10	4.2.3 (pp. 120-123)	Higher derivatives, Liouville's theorem
Week 9 4/15, 4/17	4.3.1 (pp. 124-126)	Removable Singularities, Taylor's theorem
	4.3.2 (pp.126–129)	Zeros and Poles
Week 10 4/22, 4/24	4.3.3 (pp. 130-133)	The Local Mapping
	4.3.4 (pp. 133-137)	The Maximum Principle
		Midterm Exam on 4/22 (Monday) 19:00 – 21:00
Week 11 4/29, 5/1	4.4.1-4.4.4	General statement of Cauchy's theorem
	4.4.5-4.4.7	Proof of Cauchy's theorem
Week 12 5/6, 5/8	4.5.1	The residue theorem
	4.5.2	The argument principle

Week 13 5/13, 5/15	4.6.1-4.6.5	Harmonic Functions
	4.5.3	Contour integration
Week 14 5/20, 5/22	5.1.1-5.2.1	Functions with prescribed poles
	5.1.3	The Laurent Series
Week 15 5/27, 5/29	5.2.2	Infinite products
	5.2.3	Weierstrass products
Week 16 6/3, 6/5	5.2.4	The Gamma function
	5.4.1, 5.4.2	Reimann Zeta function I
Week 17 6/12	5.4.1, 5.4.2	Reimann Zeta function I
Week 18 6/17, 6/19		Final Exam on 6/17 (Monday) 13:10 – 15 :00

Grading Scheme

期中考	30%
作業及平時表現	35%
期末考	35%

Course Hours
Lecture：Monday 13:10 - 15:00; Wednesday 14:10 - 15:00 in 數學系館 3174 教室

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