

流水號	21061
課號	MA7101
授課教師	陳建隆
課程名稱(中文)	實變函數論 I
課程名稱(英文)	Real Analysis I
學分	3
授課內容	<p>In this course we will study the following topics.</p> <p>(1) Measure Theory: Preliminaries, The exterior measure, Measurable sets and Lebesgue measure, Measurable functions, Littlewood's three principles, The Brunn-Minkowski inequality*.</p> <p>(2) Integration Theory: The Lebesgue integral, The space L^1 of integrable functions, Fubini's theorem, A Fourier inversion formula*.</p> <p>(3) Differentiation and Integration: Differentiation of the integral, The Hardy-Littlewood maximal function, The Lebesgue differentiation theorem, approximations to the identity.</p> <p>(4) Differentiability of functions, functions of bounded variation, absolutely continuous functions, differentiability of jump functions, rectifiable curves and the isoperimetric inequality*.</p> <p>(5) Hilbert Spaces: An Introduction, The Hilbert space L^2, Hilbert spaces, Fourier series and Fatou's theorem, Closed subspaces and orthogonal projections, Linear functionals and Riesz representation theorem, Adjoints.</p> <p>(6) Hilbert Spaces: Several Examples</p> <p>(7) Abstract Measure and Integration Theory, Exterior measures and Carathéodory's theorem, Integration on a measure space, Examples, Ergodic theorem*</p> <p>(8) Hausdorff Measure, Hausdorff dimension, Space-filling curves.</p>
教科書/參考書	<p>References:</p> <p>(1)* Elias M. Stein & R. Shakarchi, Real Analysis, Measure Theory, Integration, and Hilbert Spaces</p> <p>(2) H. L. Royden, Real Analysis, Third Edition</p> <p>(3) A. Zygmund, Measure Theory and Integrations</p>
授課方式	講授、研討、實習/實驗
評量方式	<p>(1) Midterm Exam (30%)</p> <p>(2) Tests of each Chapters, Exercises and Reports (30%)</p> <p>(3) Final Exam (40%)</p>
Office Hour	Wed. 13:00-15:00; Thu. 10:00-11:00