Analysis 2 Contents

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Week	Contents
W1-1	Differentiation and Integration, Hardy-Littlewood Maximal Function, Lebesgue Differential Theorem, Lebesgue Density Theorem, Approximation to the Identity(1)
W1-2	Approximation to the Identity(2), Bounded Variation(1)
W2-1	Bounded Variation(2), Absolutely Continuous, Vitali Covering Lemma, Differentiability of Jump Functions(1)
W2-2	Differentiability of Jump Functions(1) (Bounded Variation(3)), Rectifiable Curves, Banach Spaces, ℓ^p space, Linear Functionals, Dual Spaces
W3-1	Bounded Linear Functionals (X^*), Operator Norm, Isometry of Dual Space, Hahn-Banach Theorem (One-step Extension), Gauge (Minkowski Functionals)
W3-2	Hahn-Banach (General case with Zorn's lemma, normed spaces), Dual Points, Dual Space of $C^0([a,b])$, Riemann-Stieltjes Sum, $BV_0([a,b]), V([a,b])$
W4-1	Riesz Representation Theorem, Reflexive Spaces, Bounded Linear Operators
W4-2	Transpose Operator, Annihilators, Integral Operators, Differential Operators, Uniform Boundedness Principle/Banach-Strinhaus Theorem, Resonance Point, Interlude: Fourier Series
W5-1	Fourier Series(2), Open Mapping Theorem, Banach Inverse Mapping Theorem, Closed Graph Theorem
W5-2	Spectrum, Eigenvalues, Eigenvectors, Regular Value, Resolvent Set, Spectral Radius, Spectral Radiuc Formula, Hilbert Spaces