Suggested Schedule for Functional Analysis 1 lectures

The lecture videos are of various length as they are designed to cover a particular topic rather than being a specific length as in traditional lectures. The names of the videos indicate the section in the lecture notes that the video corresponds to. Below is a proposed schedule for the lectures that you might find useful to plan your term. I

As the videos are of varying length, the proposed amount of lecture time is not be exactly the same in each week, and you can of course adjust that to fit your plans. I have also adjusted the plan so that less videos are scheduled in the two weeks (W1 and W4) where there is an additional in person lecture.

The speed of the lecture is relatively slow as it is designed to be so that students who want to take notes should be able to do so without having to pause the videos. If you don't take notes it is likely more suitable to watch the video at a faster speed.

W1: In person lecture Tuesday of W1 at 9am in L1
Videos on the definition and basic properties of Banach spaces and examples (some of this will be familiar from A.2 Metric spaces):
1.1 Banach spaces (42')
1.2 Examples of normed spaces (51')

W2: Completeness of spaces and first half of the chapter on bounded linear operators:
1.3 completeness (62')
2.1 Bounded linear Operators (28')
2.2-1 Examples of bounded linear operators (38')

W3: Second half of the chapter on bounded linear operators and basic properties of finite dimensional spaces (quite a bit of the later topic will be familiar from A.2 Metric spaces)
2.2-2 Examples(part 2) and 2.3 Completeness of L(X,Y) (30')
2.4 Composition and Neumann series (34')
3.1 Basic properties of finite dimensional normed spaces (40')

W4: In person lecture on Tuesday 9am in L1
Videos on
3.2 Heine Borel property equivalent to finite dimensionality (28')
4.1 Extension of operators from dense subspaces (42')

W5: Theorem of Stone Weierstrass and dense subspaces of Lp
4.2-1 Sublattice form of Theorem of Stone Weierstrass (47')
4.2-2 Stone Weierstrass subalgebra version (40')
4.3 Approximation of Lp functions (17')

W6: Separability and Theorem of Hahn Banach
5. Separability (55')
6.1-1 Hahn-Banach for R vector spaces: Statement of results (31')
6.1-2 Proof of Hahn-Banach (R version) (25')

W7: Second half of the chapter on Hahn-Banach and first part of the Chapter on dual spaces
6.2 C version of Hahn-Banach and 6.3 Applications of HB1 (26')
6.4 Geometric applications and 6.5 further applications of HB (41')
7.1 and 7.2 on dual spaces (49')

W8: Second duals, dual operators and Spectral Theory
7.3 Second dual and completion (22')
7.4 Dual operators (14')
8.1 Invertible operators (21')
8.2-1 Basic properties of spectrum (34')
8.2-2 Spectral theory part 2 (37')

For revision:
Summary of the course (35')