

## TMA4230 FUNCTIONAL ANALYSIS, WEEK 11

**LAST WEEK:** Last week we finished Chapter 7 about the spectrum of an element of a complex Banach algebra with an identity and began on Chapter 9 about spectral theory for bounded self-adjoint linear operators on Hilbert spaces. We manage to cover Section 9.1 and begin on Section 9.2.

- Section 7.3–7.7 of the book.
- Page 61–65 of the notes.
- Spectral properties of bounded self-adjoint linear operators (Section 9.1–9.2).

**THIS WEEK:** This week we will continue with spectral theory for bounded self-adjoint linear operators on Hilbert spaces. Unfortunately, I had to cancel Thursday's lecture. I expect to cover Section 9.2–9.3 and maybe also parts of Section 9.4 in Friday's lecture.

- Spectral properties of bounded self-adjoint linear operators (Section 9.2).
- Positive operators (Section 9.3).
- Square roots of positive operators (Section 9.4).

**NEXT WEEK:** Next week we will continue with Chapter 9. My aim is to cover Section 9.4 about square roots of positive operators, Section 9.5–9.6 which deals with projection operators, Section 9.7 which introduces spectral families, and perhaps parts of Section 9.8 which deals with the spectral family of a bounded self-adjoint linear operator.

- Square roots of positive operators (Section 9.4).
- Projection operators (Section 9.5–9.6).
- Spectral families (Section 9.7).
- The spectral family of a bounded self-adjoint linear operator (Section 9.8).

**EXERCISES FOR NEXT WEEK:** 9.1.6, 9.2.9, 9.3.2, 9.3.9+10 and 9.3.11.