Aperiodic Order

TENTATIVE SCHEDULE

1. Lec. 1 (March 12) Introduction: Wang tilings, Penrose tilings, quasicrystals, crystallographic restriction. (See Intro. in [So])

2. Lec. 2 (March 19) Sturmian sequences (parts of Ch.6 in [F]).

3. Lec. 3 (March 26) Substitution sequences (parts of Ch.1.2 in [F]).

4. April 2 & 9: Passover Holiday, no lecture

5. Lec. 4 (April 16, 14:00-16:00) “Crash course” in Dynamical Systems and Ergodic Theory (1.1.3, 1.4, 1.5 from [F] and other sources). May start this in Lecture 3 already.

6. April 23: Yom Atzmaut, no lecture

7. Lec. 5 (April 30) Continuation of the “crash course”

8. May 7: no lecture (away at a conference)

9. Lec. 6 (May 14) Spectral theory of measure-preserving systems (brief overview). Tiling and Delone set dynamical systems

10. Lec. 7 (May 21) Continuation; self-similar tilings (after Thurston) and associated dynamical systems

11. Lec. 8 (May 28) More on self-similar tilings; theorem about invertibility of the substitution map (recognizability is equivalent to aperiodicity in the appropriate setting).

12. Lec. 9 (June 4) Eigenvalues for tiling dynamical systems. Pisot condition.

13. Lec. 10 (June 11) Overview of the spectral theory for substitutions of constant length (Dekking’s coincidence condition, Morse and Rudin-Shapiro substitutions).

14. Lec. 11 (June 18) Mathematical diffraction (after A. Hof), connection to dynamical spectrum.

15. Lec. 12 (June 25) Projection method and model sets.
References


[Enc] D. Frettlöh and E. Harriss (developers), Tilings Encyclopedia (online).


