Weekly topics.

1. Review of linear algebra and calculus: the vector space of polynomials, the vector space of trigonometric polynomials
   Homework assignment: matlab programming, DCT-based image compression and distortion

2. Review of linear algebra and calculus: Taylor’s theorem, inner product spaces of finite dimension, orthonormal basis, isomorphism

3. Function approximation, data interpolation.
   Linear interpolation (data fitting) methods with polynomials: Vandermonde approach, Lagrange approach, Newton approach.
   Interpolation with splines, or with parametric polynomials.
   Formation and solution of linear equations. Vandermonde system, diagonal or triangular systems, sparse systems.
   Homework assignment: function approximation using Taylor’s theorem, solution of dense and sparse linear systems, result rendering and presentation (with plots)