CAGD, 2011/2012

1. Affine spaces. Barycentric coordinates.

2. Affine maps.

3. De Casteljau algorithm.

4. Bézier curves. Properties obtained by geometric arguments.

5. Blossom of a Bézier curve.

6. Bernstein polynomials.

7. Properties of Bézier curves obtained by algebraic arguments.

8. Derivatives of a Bézier curve. Hodograph.

9. Derivatives of a Bézier curve and de Casteljau algorithm.

10. Blossom and polar.

11. Bézier curve subdivision.

12. Degree elevation of a Bézier curve. Repeated degree elevation and the variation diminishing property.

13. Nonparametric curves and cross plots.

14. Spline curves in Bézier form. Smoothness conditions.

15. C^1 и C^2 continuity of a spline curve in Bézier form. Geometric criteria.

16. C^1 quadratic spline curves. De Boor polygon. Properties.

17. C^2 cubic spline curves. Relation between Bézier polygon and de Boor polygon.

18. Cubic interpolational spline curves. Holladay's theorem.

19. Hermite interpolation.

20. Catmull-Rom spline.

21. Spline with Bessel tangents.

22. Algorithm for generating cubic spline function.

23. Tensor product Bézier surfaces. De Casteljau algorithm.

24. Triangular Bézier surfaces. De Casteljau algorithm.

25. Subdivision algorithms for curves.

26. Subdivision algorithms for surfaces.