Budapest University of Technology and Economics
Department of Architectural Geometry and Informatics
Descriptive Geometry 2
Year 2017-2018, 2nd (spring) semester

1st Drawing

Tint or pencil, size A2
Deadline for delivery: March 13, 2018

SPHERE, INTERSECTION WITH PLANE, SHADOWS; COMPOSITE SURFACE IN PERSPECTIVE, SHADOWS; CONIC SECTIONS; INTERSECTION OF SURFACES; ELLIPSOID | PARABOLOID OF REVOLUTION, SHADOWS; TORUS, INTERSECTION WITH A PLANE

1. Let a sphere and a first principal line intersecting with the sphere be given. Construct the intersection of the sphere and a pair of planes passing through the line. One of the planes is passing through the center of the sphere, the other one is perpendicular to the previous one. Remove one of the four pieces of the sphere, show the visibility of the solid and construct the shadows and shades at an arbitrary direction of parallel lighting.
2. Represent a composite surface in perspective. One component is a cylinder standing on the ground plane with the top circle in the plane of horizon. The other component is a frustum of cone of the same height as the cylinder. The base circle of the cone is concentric with the top circle of the cylinder and the radius is the half of the radius of the cylinder. The radius of the top circle of the frustum is equal to radius of the cylinder. Construct all shadows at a direction of lighting parallel to the picture plane.
3. Represent a frustum of a cone with horizontal axis. The distance of the axis and the first image plane is smaller than the radiuses of the circles. Cut the surface by the first image plane and two oblique planes passing through the first tracing lines of the planes of the circles, inclining towards the apex of the cone such that one curve of intersection should be an ellipse, the other one a parabola. Show the visibility of the part of the surface between the three planes of intersection.
4. Construct the intersection of a pair of surfaces in
   a. in orthogonal axonometry
   b. in frontal axonometry.

   The surfaces are a right circular cone standing on ***[xy]*** and a right circular cylinder on ***[yz]*** and they intersect such that he curve has one double point. Show the visibility.
5. Represent a dome in orthogonal axonometry. The surface is
   a) a semi-ellipsoid
   b) paraboloid of revolution

   Cut the dome by vertical planes parallel to ***[xz]*** and ***[yz]*** respectively.
6. Represent a torus with vertical axis and take three points of the surface; one on the elliptic, one on the parabolic and one on the hyperbolic part of the surface. Cut the surface by the plane of the three points. Construct the tangents of the curve of intersection at the principal points and the three points. Show the visibility of the lower part of the surface.

February 5, 2018, Budapest.

Dr. Pál Ledneczki
associate professor