List of abstracts of the presented materials for participation in a competition for the appointment of the academic position "associate professor" in the field of higher education 5. "Technical sciences", professional field 5.7. "Architecture, Civil Engineering and Geodesy", scientific specialty "Cartography (including thematic geographic mapping)"

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A. Monographic work

The monographic work presents the complex of past, present and future trends for the development of mathematical cartography (MK) at home and abroad. It provides an opportunity to get acquainted with the theoretical and practical statements related to the tasks and objectives of Mathematical Cartography.

Chapter 1, titled "Mapping as a Science", specifies the aims, objectives and tasks of the MC, and links with other disciplines and disciplines. The mathematical basis of maps and reference surfaces for mapping is considered.

In Chapter 2 - "Theory of Differential Geometry of Surfaces," Coordinate Systems - a surface on a curved surface, orthogonal, on a rotational ellipsoid, on a plane, are considered.

The following coordinate systems - spatial (spherical, geographic, geocentric, polar spherical and ellipsoidal), planar (rectangular and polar) are addressed in Chapter 3 - "Coordinate systems in cartography". World reference systems and accepted global and European coordinate systems are described.

Chapter 4 "Map projections" presents classifications of projections, their special properties and contemporary aspects.

Chapter 5 "Deformation Theory" is devoted to the general theory of deformations accompanying cartographic projections and the relations between azimuths and the linear scale, and the main directions and scales are defined.

Chapter 6, titled "Types of Deformations and Methods for Their Representation", presents the methods for imaging the deformations and the Tiso indicators.

Chapter 7 - "Continuous Projection Properties" presents the general theory of continuous projections and the conditions for image conformance and equivalence.

Chapter 8 "Azimutal Projections" presents basic properties of azimuthal projections, polar and equatorial projections. Special attention is paid to continuous, perspective, gnomonic, stereographic and orthographic azimutal projections.

Chapter 9 presents the theory of "Cylindrical Projections". The properties, deformations, functional dependencies and the application of cylindrical projections are examined. The projections of Mercator, UTM, Gauss-Kruger and others are explored.

Chapter 10 is dedicated to Conical Projections. Along with the theoretical concepts, different conical projections - continuous, equal length, equipotential, conformational (Lambert) and perspective - were considered.

In chapter 11 - "Negeometric projections", the pseudocylindrical, polyconical and pseudo-conical projections were examined and described.

Chapter 12 presents the possibility to select and define the basic parameters of map projections. A successful transfer to modern GIS and the capabilities they provide for automated projection selection are made. Attention is paid to the transformation of map images and transformation methods.

Chapter 13 examines practical guidelines for the application of computing technologies in practice.

B. Publications

1. 1. The properties of Conform Conical (Lambert) projection, Gaussian transverse cylindrical projection and its modification - Universal cylindrical projection of Mercator - UTM are used in the publication of the Bulgarian Geodesic System 2000 (Lambert) and the Bulgarian Geodetic System 2005 (UTM).
2. The publication is given the sequence to derive a formula for calculating the starting angle indicated by the sinus and cosine of the measured horizontal angles. The goal is to provide an easy-to-remember formula and to reduce the volume of calculations.
3. The publication discusses various methods for determining and calculating the angle of slope over a topographic map.
4. Methods for determining the visibility between two points of the topographic map are proposed in the publication, depending on the means at our disposal.
5. The publication provides different methods for determining the scale of a topographic map when it is not displayed on the map.
6. A different method is used to solve a straight-line scan on measured horizontal angles and a straight-line scan along measured angles. The goal is to provide an easy-to-remember method and to reduce the volume of calculations.
7. Various methods for determining the point of standing are proposed, depending on the means we have and the surrounding objects.
8. The methods for determining the rectangular coordinates of a topographic map point are considered.
9. The publication presents different methods for determining areas on the topographic map.
10. The types of north, the angles between them, the relationships between the corners and the methods of determining the direction to a given point of the topographic map are examined.

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