

Study program: Geodesy				
The type and level of study: Basic academic studies				
Course title: GEODETIC REFERENCE SYSTEMS				
Teacher: Delčev Siniša				
Status of the course: Mandatory				
ECTS: 5				
Conditional course: No				
The course aims Introducing students with the fundamentals of geodesy as a science dealing with the study of the size and shape of the Earth and its external gravitational field. Introduction to students with reference systems used in geodesy.				
Outcome of the course Students are introduced with the geometry of the rotational (equipotential) ellipsoid, the basics of the Earth's motion, and the reference celestial and terrestrial geodetic systems.				
The content the course <i>Theoretical classes:</i> 1. week Introduction. Definition of geodesy. History of geodesy, shortly. The shape and size of the Earth. Reference systems and frames. 2. week Rotational, equipotential ellipsoid and geodetic coordinates. Basics of the ellipsoid geometry. Curve radius. Length of meridian arc. Length of parallel arc. Double normal intersections. Geodetic line. Characteristics of the geodetic line on the ellipsoid. 3. week Geodetic coordinates. The first main geodetic task. The second main geodetic task. 4. week Coordinate systems on the ellipsoid. Ellipsoid mapping to the plane. National coordinate system. 5. week Transformation between geodetic and orthogonal Descartes coordinates. Transformation between nearby zones. 6. week Natural (astronomical) coordinates. Transformation between geodetic and natural coordinates. Celestial coordinate systems: ecliptic, equatorial and horizontal systems. 7. week I colloquium. 8. week Terrestrial reference system. Examples of horizontal geodetic Datums. International terrestrial reference system. Datums transformation. 9. week Celestial reference system. The movement of the Earth - precession and nutation. Systematic influences - the own motion of celestial bodies. 10. week Systematic influences - aberration, parallax, refraction. 11. week Relationship between the terrestrial and the celestial reference system (frame). The movement of the earth's poles, middle (conventional) celestial pole. Transformations. 12. week Time systems. Sidereal time. Universal time. Dynamic time. Atomic time. 13. week The field of Earth's gravity. Reference gravimetric systems. 14. week II colloquium. 15. week Other approximations shape of the earth - the geoid, quasigeoid... <i>Practical teaching: Exercises</i> He follows the course of theoretical classes.				
Literature 1. Vaniček P., Krakivsky E., Geodesy: the concept, North-Holland Publishing company, Amsterdam - New York - Oxford, The Netherlands, 1980. 2. Heiskanen Weiko, H. Moritz, Physical geodesy, W. H. Freeman & Co, San Francisco and London, 1967. 3. Script.				
Number of active teaching classes				Other classes: 0
Theoretical classes: 2	Practical teaching: 2	Other forms of teaching: 0	Study research work: 0	
Methods of teaching practice: lectures, exercises, colloquiums, consultations.				
Evaluation of knowledge (maximum point score: 100)				
Pre exam duties	points	Final exam		points
activity during the lectures	5	written exam		(40)
practical teaching	5	oral exam		50
colloquium-s	40	-		-