Faculty of Civil and Environmental Engineering					
Study programme:	**Spatial management**	Degree level: full-time:	**Bachelor's degree**		
Specialization		Diploma path:	**-**		
Module name:	**Numerical maps**				
Module type:	**obligatory/elective**	Semester: **3**	ECTS **4**	Module ID:	**GS 3023**
No. of hrs in semester:	L - 30 C - LC- P- SW- 30 S-				
Prerequisites:	*Complete with prerequisites or "-"*	*Geodesy and cartography*			
Teaching methods:	*lecture, specialization workshop*	*Assessment:*	*Evaluation must be relevant to the intended learning outcomes*		
		e.g.: lecture - tests; specialization workshop - completion and discussion of the project			
Aims and objectives:	*Familiarize students with the knowledge of numerical spatial information infrastructure development and use of numeric maps and their application in the analysis of spatial planning, management and space management.*				
Module content:	*General information about the maps. Basic map. Topographic map. Digital maps and their characteristics. Acquisition of data for digital maps - direct surveying, digitizing analogue maps. Spatial data - data models, data organization, data analysis. Numerical models of the site - the structure of the data, creating and processing use. Selected programs to create digital maps. Map generalization in the context of a numerical data. Gauss-Krüger projection and the Mercator. Coordinate systems used in Poland. Combined maps. Calculations related to the creation Survey digital maps. Editing digital map elements (situation and altitude). Measurement and analysis of numerical spatial map. Planning and design work on the numerical map.*				

Learning outcomes	*Write min. 4, max. 8 learning outcomes in the following order: knowledge - skills - competences. Each learning outcome must be verifiable.*	*Relevance to the programme learning outcomes*
LO1	owns and interprets knowledge of basic topographic map as a component of the National SIT	K_W12, K_W20
LO2	know the nature of digital maps and describes various aspects, conditions and methods of their creation	K_W12, K_W20
LO3	versed in use in Poland, spatial reference systems, cartographic mapping and nomenclature map	K_W12, K_W20
LO4	can acquire geospatial data from multiple sources in order to create or update maps	K_U01

LO5	develops text and graphics documentation on the use of geospatial data and maps	K_U02	
LO6	able to apply the theoretical knowledge gained by using it in the tasks related to the management of space	K_U18, K_U21, K_U22	
LO7	able to apply the theoretical knowledge gained by using it in the tasks related to the management of space	K_K01	
LO8	responsibly preparing for the profession	K_K04	
student workload	lecture attendance	15 x 2h	30
	participation in specialization workshop	15 x 2h	30
	preparation for specialization workshop		20
	work on projects, reports, etc.		5
	participation in student-teacher sessions		5
	preparation for discussion of project		5
	preparation for exams/tests		10
		TOTAL:	105
quantitative indicators	Student workload - activities that require direct teacher participation	65	ECTS
			2,5
	Student workload - practical skills activities	65	2,5
basic references:	*1. Gaździcki J.: Systemy informacji przestrzennej. PPWK, Warszawa, 1990. 2. Kowalczyk K.: Wybrane zagadnienia z rysunku map. Wyd. UW-M, Olsztyn, 2007.* *3. Izdebski W.: Wykłady z przedmiotu SIT / mapa zasadnicza. (www.izdebski.edu.pl).* *4. Osada E.: Krajowy system informacji o terenie. Wyd. Naukowe DSW, Wrocław 2009.*		
supplementary references:	*1. Handbook on Geographic Information Systems and Digital Mapping. United Nations, New York 2000;* *2. Kresse W., Danko D.: Handbook of Geographic Information. Springer 2012;* *3. Instrukcja obsługi programów WinKalk i MikroMap (www.coder.atomnet.pl)* *4. Instrukcja obsługi programu C-Geo (www.softline.xgeo.pl)*		

learning outcomes	*methods of assessing learning outcomes*	type of class (if more than one) where the outcomes are assessed
LO1	written test(-s) of lecture, evaluation/discussion of reports on SW	L, SW
LO2	written test(-s) of lecture, evaluation/discussion of reports on SW	L, SW
LO3	written test(-s) of lecture, evaluation/discussion of reports on SW	L, SW
LO4	evaluating of work in classes; evaluating of reports and event. discussion	SW
LO5	evaluating of work in classes; evaluating of reports and event. discussion	SW
LO6	evaluating of work in classes; evaluating of reports and event. discussion	SW
LO7	observation of work in classroom	SW
LO8	observation of work in classroom	SW

Department:	**Division of Spatial Information**	Group instructors:	dr hab. inż. Andrzej Kobryń mgr inż. Iwona Kosk

Date:	30.01.2012	Coordinator:	dr hab. inż. Andrzej Kobryń

L - lecture C - class LC - laboratory class P-project
SW - specialization workshop S - seminar