

Land Governance Master program

Discipline ***“Land Information Systems”***

Responsible university

Donetsk National Technical University

Course is developed by

Prof. Sholomitski A., Gavrilenko D.



Land Information Systems

Integrative module

Total ECTS - 5

Is studied in

1st year

2 term

for Technical and Agrarian

Universities



Basis for learning

- Informatics
- Land Cadastre
- GIS and Databases



Aim and objectives of the course

To provide deep theoretical and practical studies in the domain of:

- modeling, creation and use of land information systems;
- basic technologies in LIS (data bases, GIS, Network/Internet),
- processes of data acquisition and processing.



Land information systems

Total hours	Classroom total/ hours	lectures	practice	Exam/ hours	individual student's work	% of class rooms
180	64	32	32	54	62	0,4



Course syllabus

N	Topic name	Number of hours		
		Total	Lectures	Pract./exercises
1.	History of Land Information System development	2	2	-
2.	Legislative base of Information System creation	8	4	4
3.	Information base of Land Information System development	14	6	8
4.	GIS-technologies in Land Information System development	12	4	8
5.	Monitoring as a part of Land Information System	2	2	-
6.	Conceptual framework of Land Information System	8	2	6
7.	Information in Land Information System	12	6	6
8.	Examples of Land Information Systems	6	6	-
	Total:	64	32	32



Structure of the lectures

Lecture N 1 History of Land Information System development – 2h.

- Classification of information systems.
- History of land information systems development in foreign countries.
- Development of Land information system in Ukraine.

Lectures N 2-3 Legislative base of Information System creation – 4h.

- Cadastre. LIS in state system.
- Standardization.
- The importance of public access to official records.
- LIS - basis for land market.
- Classification and use of land information systems.
- Composition and structure of land information systems.
- Kinds of records.



Structure of the lectures

Lectures N 4-6 **Information base of Land Information System development** – 6 h.

- Development and perspectives of information systems.
- Software environment for implementation of information systems.
- Architecture of data bases.
- Use of identifiers and classifiers.
- Distributed databases.
- Network and cross-platform interaction.
- Information recourses and networks, approaches and tools for interaction with them.
- Different ways of data presentation in Internet.
- Classification of map web-services.



Structure of the lectures

Lectures N 7-8. GIS-technology in Land Information System development – 4 h.

- Fundamentals of GIS.
- GIS as a part of LIS.
- Layers in GIS.
- Spatial analysis.
- Parcels as a layer in GIS.
- Links between spatial and attribute data of parcels.
- Land parcels information retrieval via GIS .

Lecture N 9. Monitoring as a part of Land Information System – 2 h.

- Monitoring as a component part of LIS.
- Libraries of objects' classifiers in LIS.
- Objects' recognition.



Structure of the lectures

Lecture N 10. Conceptual structure of Land Information System – 2 h.

- Typical tasks of LIS.
- Structural scheme of LIS.
- Standardization of the LIS structure.
- Standardization of software and information in LIS.
- Definition and classification of main processes, methods and means of standardization.
- World and national levels of standardization.



Structure of the lectures

Lectures N 11 – 13. Information in LIS – 6 h.

- Data acquisition and administration.
- Ways of data presentation, storage and displaying.
- Data retrieval.
- Information update.
- Data access and application.
- Data exchange and converting.
- Data exchange formats.
- Standard exchange formats: GML, LandXML, KML, Exchange file in Ukraine IN4.
- Properties of data. Classification of data.
- Quality of attribute and spatial data.
- Data integrity and protection.



Structure of the lectures

Lectures N 14 -16. Examples of Land Information System – 6 h.

- LIS in Germany ALKIS: description, structure, functions and perspectives.
- LIS in Russia ЕГРЗ: description, structure, functions and perspectives.
- LIS in Ukraine: description, structure, functions and perspectives.



Structure of the practical works

№ topic	Tasks and content of practical works	hours
1	Legislative base of LIS creation: Studying of legislative bases of LIS in Ukraine	2
2	Information base of LIS development: justification for software choice in LIS development	4
3	GIS-technologies in LIS development: ArcView, ArcGIS, GeoGraf and MapInfo. Spatial data representation in different GIS.	8
4	Conceptual framework of LIS. Analysis of functional possibilities of different: <ul style="list-style-type: none"> • ArcView • ArcGIS • GeoGraf • MapInfo. 	2 2 2 2



Structure of the practical works

№ topic	Tasks and content of practical works	hours
5	Information in Land Information System:	
	➤ development of LIS structure in Ukraine	2
	➤ Calculation of LIS's hardware	2
	➤ Calculation of costs for LIS development	2
	➤ Calculation of profits from LIS implementation	2
	➤ Elaboration of exchange file's format between different LIS.	2
	Total	32

List of literature

- **Larsson G.** Land registration and cadastral system. – Stockholm.: KTH, 2000.– 168 p.
- **Kaufmann J. Steudler D.** Cadastre 2014 a vision for a future cadastral system [Электронний ресурс]; Режим доступу: www.fig.net/cadastre2014/translation/c2014-english.pdf – Заголовок з екрану;
- **Kaufmann J.** Assessment of the Core Cadastral Domain Model from a Cadastre 2014 point of view. Joint ‘FIG Commission 7’ and ‘COST Action G9’ Workshop on Standardization in the Cadastral Domain, Bamberg, Germany, 9 and 10 December 2004 [Электронний ресурс]; Режим доступу: http://www.fig.net/commission7/bamberg_2004/papers/ts_04_01_kaufmann.pdf – Заголовок з екрану;
- **Lemmen C., Van Oosterom P.** Version 1.0 of the FIG Core Cadastral Domain Model [Электронний ресурс]; Режим доступу: www.fig.net/pub/fig2006/papers/.../ts12_02_lemmen_vanoosterom_0605.pdf – Заголовок з екрану;
- **Автоматизированная система государственного земельного кадастра Донецкой области / Могильный С.Г., Гавриленко Ю.Н., Шоломицкий А.А. и др. / Сучасні досягнення геодезичної науки і виробництва (погляд у XXI століття): Зб. наук. праць. – Львів: Ліга–Прес, 2000. –С.201–203.**



List of literature

- **Наказ Держкомзема України** «Про затвердження вимог до структури, змісту та формату файлу обміну даними результатів землевлпорядних робіт в електронному вигляді (обмінного файлу)» [Електронний ресурс]; Режим доступу: <http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=z0157-10> – Заголовок з екрану;
- **Варламов А.А., Гальченко С.А.** Земельный кадастр. Т.6. Географические и земельные информационные системы. – М.: Колос, 2006. – 400 с.
- **OpenGIS Geography Markup Language (GML) Encoding Standard**
http://portal.opengeospatial.org/files/?artifact_id=20509
- **LandXML-1.2 Word Doc** <http://www.landxml.org/schema/LandXML-1.2/LandXML-1.2%20Documentation.zip>
- **Шекхар Ш., Чаула С.** Основы пространственных баз данных. – М.:Кудиц-образ. 2004. – 330 с.
- **Крёнке Д.** Теория и практика построения баз данных. 8-е издание. – Питер. 2003. – 800 с.
- **Коннолли Т., Бегг.К., Страчан А.** Базы данных: проектирование, реализация и сопровождение. Теория и практика.
- **Documentation on the Modelling of Geoinformation of Official Surveying and Mapping in Germany.** [Електронний ресурс]; Режим доступу: [GeoInfoDok-V5.1-english.pdf](#) –

