PhD program: Cartography and GeoInformatics

General Information	
University	Osh Technological University named after M. Adyshev (OshTU)
Course title	**Spatial Data Infrastructure**
Course/Module code	SDI
Course type	Elective
Year of Study	1st year
Term/Semester	Spring semester
Credits awarded	5 ECTS (150 academic hours)
Degree	PhD
Enrollment status	Full-Time
Entry requirements/ Competences	

Lecturer's details	
Name, surname	
Academic title	
Contact details	
Office hours and consultation schedule	
Course Structure	
Course Aim and Objectives	The aim of the course is that students should acquire knowledge and skills related to Spatial Data Infrastructure. The course provides an overview of SDI organizational and technical components. Students will explore theoretical and practical concepts of Spatial Data Infrastructures (SDIs). It includes an introduction to Geographic Information Systems to harmonize the terminology and concepts related to spatial data, spatial data analysis, modeling and spatial databases.
Short Description	SDI
Module/Topic	Spatial Data Infrastructures
Teaching Method	- Regular lectures; - Laboratory and practical works - Project work - Discussions in class

Form of Assessment	− Labs and computing tasks (25%) − Class discussion/participation (10%) − Project report (40%) − Final exam (25%)
Knowledge and understanding	- describe the importance of spatial data for planning, decision making and sustainable development - describe the current status/problems for spatial data in terms as availability, accessability, applicability and usability, - describe the general concepts and the aims for SDI and the importance of data exchange, in detail, explain and give an account of the main components of SDI, - describe the factors that influence the development of SDI and the nature of these factors, - at a general level describe the concepts clearinghouse networks and geoportals, - in detail explain the different generations of clearinghouse networks, the main components of these networks, interoperability of these systems, the available standards to achieve interoperability and the principles of service orchestration, - explain the cartographic aspects for geoportals - give an account of concepts and technologies for modelling and evaluation of SDIs - describe and discuss what is meant with a society that is spatially enabled.
Learning Outcomes	On completion of the course, the student shall be able to: - plan for the requirements that a society sets on SDI, - use and develop the standards and specifications that are required for SDI, - use and suggest policy that are needed for SDI, - design interoperable clearinghouse networks and geoportals for SDIs, - evaluate and process SDIer.
Course content	Lesson 1. Introduction to SDI ▪ Introduction ▪ Web and the Information Society. ▪ What is SDI? ▪ SDI Interoperbility ▪ Regulation: INSPIRE and National Cartographic System (LISIGE).

	Lesson 2: Internet, Communications, Protocols and Identification of resources. Client / Server Architecture. OGC.
	▪ Introduction ▪ Internet (protocols and address). ▪ ISO 19119 Services Lesson 3: Data Services. ▪ Map Service (ISO 19128). ▪ Feature Service (WFS). ▪ Coverage Service (WCS). ▪ Other Services (positioning ISO 19116, ISO 19117 representation). Lesson 4: Description, Discovery and access to Data. ▪ Introduction ▪ Metadata and Metadata Services (ISO 19115-1, 19115-2, ISO 19139). ▪ Catalogues and Catalog Service (OGC-WFS). ▪ Gazetter (ISO 19112) and Gazetter Services (OGC-Gazetter). Lesson 5: Technological Aspects. ▪ XML ▪ HTML and CSS. ▪ GML. ▪ JAVASCRIPT. Lesson 6: SDI Projects. ▪ Intellectual property of Geographic Information. ▪ Legal Aspects. ▪ Licensing Models. ▪ Economic Aspects. PRACTICES: Lab #1. - Data Services. Lab #2. - Metadata. Lab #3. - Technologies Applied to SDI. Lab #4. - SDI evaluation. Lab #5. - Compare existing legislation, standards, etc used in different SDI. Lab #6. - Develop or improve some specific component for an existing SDI.

	Lab #7. - Improve an existing SDI to support risk management/Environmental modeling.
Literature:	**Mandatory:** - Developing Spatial Data Infrastructures: From Concept to Reality. Edition: -. Author: Ian P. Williamson (Editor), Abbas Rajabifard (Editor), Mary-Ellen F. Feeney (Editor). Publisher: CRC Press - ISO standards for geographic information. Edition: -. Author: Kresse, Wolfgang. Publisher: Berlin: Springer, cop. 2004 - Geographic information metadata for spatial data infrastructures. Edition: 1st ed. Author: Nogueras-Iso, Javier. Publisher: Berlin; New York: Springer, 2005 **Elective:** - Maps and the internet. Edition: 1st ed. Author: -. Publisher: Amsterdam; London: Elsevier, 2003. - Internet GIS: distributed geographic information services for the internet and wireless networks. Edition: -. Author: Peng Zhong-Ren. Publisher: New Jersey: Wiley, cop. 2003