Study program: Geoinformation Technologies

Qualification: PhD

General Information	
University	Yerevan State University (YSU)
Course title	**Geoprograming (SQL)**
Course/Module code	Geoinformation Technologies
Course type	Mandatory
Year of Study	1st Year, 2nd semester
Term/Semester	Spring Semester
Credits awarded	2 (ECTS), 56 Hours (16 theory, 40 practice)
Degree	PhD
Enrollment status	Full-Time
Prerequisites and co-requisites (if applicable):	No prerequisites

Lecturer's details	
Name, surname	Vahan Manukyan
Academic title	Associate Professor
Contact details	Email: v.manukyan@ysu.am,v.manukyanysu@yahoo.com
Office hours and consultation schedule	09:00-14:00 Monday, Wednesday, Friday

Course Structure	
Type (compulsory/ optional):	Compulsory
Course Goal	The aim of the course is to introduce the main concepts of database structure, data collecting methods, and geospatial data management. In this course students will be familiar with different types of database management system such as SQL and NoSQL. The introduction of BIG Geospatial Data is also a part of this course, which gives the opportunity to select appropriate

	data sets and computing methods for GIS tasks. The principles of SQL commands to define and manipulate the geospatial data will provide necessary skills to choose appropriate DBMS, analyze the data and visualize it in GIS.
Learning Outcomes	After completing this course, the students will be able: • To describe data structures and main data types, • To describe main database objects: tables, indexes, views, • To develop SQL and NoSQL geographically related data base, • To create database in SQL DBMS, • To characterize data structure, and analyze BIG Geospatial data, • To analyze geospatial data in PostgreSQL and visualize them in GIS environment.
Course contents	1. Introduction of Database, 2. Geospatial data, methods of acquisition, 3. BIG Geospatial Data, 4. Relational Database, 5. SQL functions, 6. SQL conditional expressions, 7. SQL joins (inner, outer), 8. Getting started with PostgreSQL & PostGIS, 9. PostgreSQL & PostGIS creating and managing databases, 10. Viewing data in QGIS,
Assessment methods and criteria	• Practical task • Project task • Final test exam For successfully accomplishment this course student must complete practical task with 5 points average grade. The project task with 10 points average grade which should be developed and introduced

	individually before final test exam. Project tasks should cover coding skills and working with geospatial data. Final exam will check the theoretical part of the course with 5 points average grade.
Recommended textbooks and links (in order of relevance):	• Pavel Luzanov, Egor Rogov, Igor Levshin (translated by Liudmila Mantrova) PostgreSQL for beginners: eBook (2018) • Peng Yue, Liangcun Jiang, BigGIS: How Big Data Can Shape Next-Generation GIS, DOI: 10.1109/Agro-Geoinformatics.2014.6910649, 2014. • PostgreSQL Documentation- https://www.postgresql.org/docs/ • SQL - https://www.w3schools.com/sql/default.asp • MySQL- https://dev.mysql.com/doc/ • PostGIS - https://postgis.net/documentation/ • https://www.codecademy.com/ • http://www.coursera.org/ • PostGIS Cookbook (www.packtpub.com/product/postgis-cookbook/9781788299329): • http://www.datacamp.com/ • www.udemy.com • http://www.bostongis.com/