TITLE OF THE Curricula/Module

GEOINFORMATION SYSTEM IN HYDROTECHNICAL CONSTRUCTION

TIIAME/Uzbekistan

March, 2020

Template of the Curriculum/Module Description

Short Name of the University/Country code Date (Month/Year)	TIIAME/UZ 03/2020
TITLE OF THE Curricula/Module	**Code**
Geoinformation system in Hydrotechnical Construction	

Teacher(s)	Department
Coordinating: **Prof. Bakiev Masharif** **Ass. Khojiakbar Khasanov**	Hydrotechnical structures and engineering constructions

Study cycle	Level of the Module	Type of the Module
BA/MA/PhD	Bachelor	

Form ofdelivery	Duration	Langage(s)
offline	16 weeks	uzbek

Prerequisites	
Prerequisites: To know: Hydrotechnical Engineering Programming Fundamentals Mathematical Modelling Possess: Basic programming skills	**Co-requisites (if necessary):**

ECTS (Credits of the module)	Total student work load hours	Contact hours	Individual work hours
6	182	64	118

Aim of the module (course unit): competences foreseeen by the study programme
This course forms the skills for selecting and applying new methods and new practices in hydrotechnical structures and their exploitations. Students will gain modern knowledge on the sphere of hydrotechnical structures exploitation. The knowledge gained from the course will help students to solve practical problems in future

professional activities.		
Learning outcomes of module (course unit)	**Teaching/learning methods**	**Assessment methods**
To point: • the field of construction of hydrotechnical structures (water reservoir); To explain: • modern methods of determining the potential location for the construction of the water reservoir; To numerate: • the role and importance of GIS and RS in determining potential sites for water reservoir construction and in determining the initial parameters of the reservoir; To recognize: • types of information of DEMs for water reservoir construction area; To give examples of: • water reservoirs that recommended for construction; To describe: • basic methods and algorithms formation of determining the initial parameters of the reservoir, data analysis, comparison of old and new data, forecasting scenarios; To formulate: • basic principles, methods and tasks of water reservoir construction.	Lectures, independent study of the material	Quiz
To be able to: • DEM data collection; • retraining of data in GIS software packages for using in the project; • accuracy of DEM; • compare of DEMs	Implementation of the training project	Presentation of an educational project
Possess: • determining the potential location for the construction of the water reservoir use of remote sensing; • determining the initial parameters of the reservoir; • determining the initial parameters of the reservoir, DEM data analysis, comparison of DEM data. • development watershed.	Implementation of the training project	Presentation of an educational project

Themes	Contact work hours							Time and tasks for individual work	
	Lectures	Consultations	Seminars	Practiaclwork	Laboratory work	Placements	**Total contactwork**	**Individual work**	**Tasks**
Fundamentals of construction of hydrotechnical structure(water reservoir)	8	0	0	8	0	0	**16**	**32**	Basic information of determining the watersheds for the construction of the water reservoir Principles of construction of the water reservoir Basics of construction of the water reservoir Theory of methods of the construction of the water reservoir
Digital elevation models. Principles of DEM.	8	0	0	8	0	0	**16**	**32**	The development of a digital model from the topographic map of the area of the construction of the reservoir in the country. Collecting of some DEMs of a reservoir site from open-source sites Methods for comparing the accuracy of DEMs
The initial parameters of the water reservoir.	8	0	0	8	0	0	**16**	**24**	Generating a specified elevation (contour) to determine reservoir surface area and volume. Working with vector data. Determining the initial parameters(water area, volume storage, the longitudinal profile of the dam, and others) of the water reservoir.
Data analysis in GIS.	8	0	0	8	0	0	**16**	**24**	Studying methods and tools for data preprocessing; The application of the probabilistic model of learning; Data analysis, comparison of old and new data, forecasting scenarios
Total	**32**	**0**	**0**	**32**	**0**	**0**	**64**	**112**	

Assessment strategy	Weight in %	Deadlines	Assessment criteria
Intermediate control - 1	-	8 week	Presentation of an educational project
Intermediate control – 2	-	16 week	Presentation of an educational project
Final exam	100 (5)	18 week	Final quiz

Compulsory literature / Author	Year of issue	Title	No of periodical or volume	Place of printing. Printing house or internet link
Bakiev M., Majidov I., Khodjakulov R., Nosirov B., Rakhmatov M.	2008	Hydrotechnical Structures		Tashkent, TIIAME
M. R. Bakiev, N.Rahmatov, A.Ibraymov	2012	Use of Hydrotechnical Structures in Canal		Tashkent, TIIAME
M.G.Kadirova	2010	Use of Hydrotechnical Structures in the River		Tashkent, TIIAME
Additional literature				
Barnali Dixon, Venkatesh Uddameri	2016	GIS and Geocomputation for Water Resource Science and Engineering		American Geophysical Union https://www.wiley.com/en-us/GIS+and+Geocomputation+for+Water+Resource+Science+and+Engineering-p-9781118826171
Lynn E. Johnson	2009	Geographic Information Systems in Water Resources Engineering		Taylor & Francis Group, LLC, Boca Raton, London and New York

ANOTATION /course summery

This course forms the skills for selecting and applying new methods and new practices in hydrotechnical structures and their exploitations. Students will gain modern knowledge on the sphere of hydrotechnical structures exploitation. The knowledge gained from the course will help students to solve practical problems in future professional activities.

List of themes and short description

Themes	Contact work hours
Fundamentals of construction of hydrotechnical structure(water reservoir) Basic information of determining the watersheds for the construction of the water reservoir. Principles of construction of the water reservoir. Basics of construction of the water reservoir. Theory of methods of the construction of the water reservoir.	**16**
Digital elevation models. Principles of DEM. The development of a digital model from the topographic map of the area of the construction of the reservoir in the country. Collecting of some DEMs of a reservoir site from open-source sites. Methods for comparing the accuracy of DEMs	**16**
The initial parameters of the water reservoir. Generating a specified elevation (contour) to determine reservoir surface area and volume. Working with vector data. Determining the initial parameters(water area, volume storage, the longitudinal profile of the dam, and others) of the water reservoir.	**16**
Data analysis in GIS. Studying methods and tools for data preprocessing. The application of the probabilistic model of learning. Data analysis, comparison of old and new data, forecasting scenarios.	**16**