

## **Annotation of the subject**

### General hydrology with basics of oceanography

1. General Hydrology with basics of oceanography (for students of geography)

2. Klymenko Valentyna Grygorivna, Associate Professor

3. Normative course

4. First year , 2 semestre

5. Five credits (120 hours), 5 academic hours per week (3 hours - lectures, 2 hours - laboratory works), 60 hours - independent work.

6. **General Hydrology with basics of oceanography** can not successfully develop without the achievements of basic sciences like physics, chemistry, mathematics, geology, geomorphology, cartography. Mathematics in hydrology is used in two ways: first, mathematical methods of mathematical statistics are widely applied in processing of the observations materials; secondly, the use of physical laws in hydrology requires strict mathematical reasoning and mathematical modeling methods.

7. **General Hydrology with basics of oceanography** studies distribution and water circulation in the world, individual components of the hydrosphere, the relationship between them, the most common patterns of hydrological processes and phenomena occurring in them, interacting with the atmosphere, biosphere and lithosphere and under the influence of economic activity. The term “general” indicates that it addresses the most common questions of hydrology and concerns all water bodies of the Earth.

**The subject study of hydrology** is bodies of water: oceans, seas, rivers, lakes and reservoirs, wetlands and water accumulation in the form of snow, glaciers, soil and groundwater.

General Hydrology with basics of oceanography according to the objects of study is divided into two distinct parts: sea hydrology and land hydrology.

### **Competencies for students to master in the course of "General hydrology with basics of oceanography"**

1. *Mastering basic terminology of a general hydrology course with the basics of oceanography, conceptual apparatus.* This allows to justify the actuality, object, subject of study, to determine the purpose and objectives of the course.

2. *Professional.* This allows to understand the basic rules, laws; properties of hydrosphere; basic methods and terms related to the study, the use and control of the world's and Ukraine's water resources; primary general knowledge of general hydrology with basics of oceanography for sustainable and integrated use of water resources in the economy, to solve the problems of nature; be able to define the basic parameters of water body using the cartographic material, data of monitoring observations; hydrological survey and the situation analysis within the catchment area, to be able to determine the region's water resources and the nature of their changes under the influence of economic activity.

3. *Processing and analysis of primary data, their explanation.* This provides systematization, statistical analysis of the results for water bodies; establishing linkages between individual indexes.

Hydrology is widely used in our time. Information about the objects, their regime, hydrological calculations, forecasts of water regime elements, quantity and quality of water required to meet the needs of hydropower, marine and river fleet, industrial, municipal, urban and agricultural water supply, construction of settlements,

industrial plants, bridges, fishing farming, irrigation and drainage reclamation, recreation organization.

***The main objectives of the course:***

1. To give an idea of the general laws of hydrological processes on Earth, to show the relationship between the hydrosphere and the atmosphere, biosphere.
2. To acquaint students with basic laws of geographical distribution of water bodies; glaciers, groundwater, rivers, lakes, reservoirs, swamps, oceans and seas, with their basic hydrological and geographical features.
3. To show basic hydrological processes in the hydrosphere in general and in water bodies of different types from positions of the fundamental laws of physics.
4. To identify the main methods of hydrological studies.
5. To show the feasibility of geographical and hydrological study of water bodies and hydrological processes for the economy and solution of environmental protection tasks.

***8. The main forms of knowledge control:***

- Lectures, discussions, lectures, debates;
- Laboratory work to consolidate the main provisions of theoretical courses by the students, familiarization and work with reference books, materials on hydrology, skills on hydrological observations and calculations;
- Independent work of students;
- Consultations;
- tests.

***The program consists of 3 sections and requirements for the knowledge and skills:***

*Section 1.* General ideas on hydrology. Distribution of water on the globe. Water cycle, properties and values. Physical -chemical properties of natural waters. Hydrology of rivers.

*Section 2.* Groundwater Hydrology. Hydrology of lakes and reservoirs. Hydrology of wetlands. Hydrology of glaciers.

*Section 3.* Hydrology of oceans and seas. Water resources of Ukraine. Protection of water resources.

9. Students' knowledge ranking is determined by test (points).

1. Klymenko V.G. General hydrology: a textbook for students-geographers / V.G. Klymenko.- H. : V.N.Karazin KNU, 2006. – 166p.

2. V. G.Klymenko. General hydrology: Program and laboratory works for 1-year students - geographers of the Department of Geology and Geography / V.G. Klymenko, V.A. Levytska - Kharkiv, Kharkiv National University, 2007. - 62 p.

3. V. G.Klymenko. General hydrology. Ukrainian-Russian dictionary: textbook / V.G. Klymenko, N.I.Cherkashyna. - H. : V.N.Karazin KNU, 2008. – 176p.

4. V.G. Klymenko. General hydrology: textbook /V.G. Klymenko. - Kharkiv:V.N. Karazin Kharkiv National University, 2012. - 280 p.

10. Ukrainian language.

**11. References:**

**Basic**

1.General hydrology: textbook / Levkivsky S.S., Hilchevsky V.K., Obodovsky O.G., Budkina L.G. et al. - K.: Phytosociocentre, 2000. – 264p.

2. Hopchenko Ye.D. Land hydrology with the basics of water reclamation / Ye.D. Hopchenko, O.V. Hushlya. - K, 1994. - 295 p.
3. Gorev L.M. Hydrochemistry of Ukraine: Textbook / L.M. Gorev., V.I. Peleshenko., V.K. Hilchevskyy. - K.: Vyshcha Shkola, 1995. - 308p.
4. Luchsheva L.A. Applied hydrology / L.A. Luchsheva. - L.: Hydrometeoizdat 1976 - 440p.
5. Yatsyk A.V. Hydroecology. / A.V. Yatsyk., V.M. Shmakov - K.: Urozhai, 1992. - 192p.

#### **Auxiliary**

1. Bilous G.M. The impact of economic activities on water resources of Ukraine / G.M. Bilous. - K.: Naukova Dumka, 1999. - 211p.
2. Vladimirov A.M. Hydrological calculations / A.M. Vladimirov. - L., 1990. - 365p.
3. Doroshin Yu.P. Regional oceanography. / Yu.P. Doroshin - M., 1986. - 173p.
4. Konenko H.D. Hydrology of ponds and small reservoirs of Ukraine / H.D. Konenko. - K.: Naukova Dumka, 1991. - 350p.
5. Small rivers of Ukraine. Directory / A.V. Yatsyk, L.B. Byshovets, Ye.O. Bohatov et al. / Ed. A.V. Yatsyk - K.: Urozhai, 1991. - 294p.
6. Methods of economic evaluation of surface water quality for the respective categories. / V.D. Romanenko, V.M. Zhulynsky, O.P. Oksynyuk et al. - K.: Symbol. - T., 1998. - 28p.
7. Hilchevsky V.K. Water supply and sanitation: hydroecological aspects / V.K. Hilchevsky. - K.: CC Kyiv University, 1999 - 264 p.
8. A.V. Yatsyk. Environmental Principles of rational water use / A.V. Yatsyk. - K: Genesis, 1997. - 640 p.

#### **12. Information Resources**

1. Central Scientific Library of Kharkiv V.N. Karazin National University funds .
2. The library funds of the Department of physical geography and cartography.
3. The Internet.