MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

Yuriy Fedkovych Chernivtsi National University

Faculty of Geography

EDUCATIONAL AND PROFESSIONAL PROGRAMME HYDROLOGY

for the training of applicants for the second (master's) level of higher education
in specialty 103 *Earth Sciences*
field of knowledge 10 *Natural Sciences*
Qualification: Master of Earth Sciences (Hydrology)

APPROVED
By the Academic Council of the University
Chairman of the Academic Council of the University
_____ / Roman PETRYSHYN /
(Protocol No. ___ dated "__" _____ 2022)
The educational programme shall enter into force on September 1, 2022
Rector _____ / Roman PETRYSHYN /
(Order No. ___ dated "__" _____ 2022)

Chernivtsi
2022

AGREEMENT SHEET
of the Educational and Professional Programme

"DEVELOPED"
By the Working Group of the Department of Hydrometeorology and Water Resources Yuriy Fedkovych Chernivtsi National University
Head of the Working Group
_____ Yu.S. Yushchenko
"___" _____ 2022

"APPROVED"
At the meeting of the Department of Hydrometeorology and Water Resources Yuriy Fedkovych Chernivtsi National University
Protocol No. __ dated "___" _____ 2022
Head of the Department
_____ Yu.S. Yushchenko

"ENDORSED"
By the Academic Council of the Faculty of Geography
Yuriy Fedkovych Chernivtsi National University
Protocol No. __ dated "___" _____ 2022
Chairman of the Academic Council of the Faculty of Geography
_____ M.D. Zayachuk

"AGREED"
Head of the Academic Department
Yuriy Fedkovych Chernivtsi National University
_____ Ya.D. Harabazhiv
"___" _____ 2022

"RECOMMENDED"
By the Educational and Methodological Commission of the Academic Council
Yuriy Fedkovych Chernivtsi National University
Protocol No. __ dated "___" _____ 2022
Chair of the Commission
_____ O.V. Martynyuk

FOREWORD

Developed by the working group consisting of:

Surname, First Name, Patronymic	**Position Title** (*for part-time staff – main place of employment and position*)	**Academic Degree and Title, Department (Specialty) of Conferment**
Head of the Working Group: Yurii Serhiiovych Yushchenko	Professor, Head of the Department of Hydrometeorology and Water Resources, Yuriy Fedkovych Chernivtsi National University	Doctor of Geographical Sciences, specialty 11.00.07 – "Land Hydrology, Water Resources, Hydrochemistry," Diploma No. DD 004903 dated 09.03.2006; Professor of the Department of Hydroecology, Diploma No. 12PR 004823 dated 19.04.2007
Members of the Working Group:		
Andrii Mykolaiovych Nikolaiev	Associate Professor of the Department of Hydrometeorology and Water Resources, Yuriy Fedkovych Chernivtsi National University	Candidate of Geographical Sciences, specialty 11.00.11 – "Constructive Geography and Rational Use of Natural Resources," Diploma No. DK 068024 dated 31.05.2011; Associate Professor of the Department of Hydroecology, Water Supply and Wastewater Disposal, Diploma No. 12DC 039689 dated 12.06.2014
Olha Viktorivna Palanychko	Associate Professor of the Department of Hydrometeorology and Water Resources, Yuriy Fedkovych Chernivtsi National University	Candidate of Geographical Sciences, specialty 11.00.07 – "Land Hydrology, Water Resources, Hydrochemistry," Diploma No. DK 060202 dated 26.05.2010; Associate Professor of the Department of Hydroecology, Water Supply and Wastewater Disposal, Diploma No. 12DC 034199 dated 25.01.2013
Mykola Dmytrovych Pasichnyk	Associate Professor of the Department of Hydrometeorology and Water Resources, Yuriy Fedkovych Chernivtsi National University	Candidate of Geographical Sciences, specialty 11.00.07 – "Land Hydrology, Water Resources, Hydrochemistry," Diploma No. DK 010475 dated 30.11.2012; Associate Professor of the Department of Hydrometeorology and Water Resources, Diploma No. AD 011038 dated 01.02.2022

Developed by the working group consisting of:

Surname, First Name, Patronymic of the Head and Members of the Project Group	Position Title, Place of Employment	Name of the Higher Education Institution Graduated From, Year of Graduation, Specialty, Qualification According to the Diploma	Academic Degree, Code and Name of the Scientific Specialty, Dissertation Topic, Academic Title, Department (Specialty) of Conferment	Experience in Scientific and Pedagogical and/or Research Work	Information on Scientific Activity (*main publications in the field, research work, participation in conferences and seminars, supervision of postgraduate and doctoral students, student research supervision*)	Information on the Instructor's Professional Development (*name of institution, type of document, topic, date of issue*)
Head of the Project Group						
Yurii Serhiiovych Yushchenko	Professor, Head of the Department of Hydrometeorology and Water Resources Yuriy Fedkovych Chernivtsi National University	Chernivtsi State University, 1979, "Geography", Geographer, Teacher of Geography, Diploma No. B-1 535890 dated 20.06.1979	Doctor of Geographical Sciences, specialty 11.00.07 – "Land Hydrology, Water Resources, Hydrochemistry," Diploma No. DD 004903 dated 09.03.2006, Doctoral dissertation topic: "Geo-hydromorphological Patterns of Channel Self-Formation under Different Natural Conditions." Professor of the Department of Hydroecology, Certificate No. 12PR 004823 dated 19.04.2007	38	**Experience in Scientific and Pedagogical and/or Research Work:** Item 1, 3, 4, 7, 8, 9, 10, 11, 14, 15, 19 **Information on Scientific Activity:** 1. *Hydroecological Justification of Safe and Balanced Development of Natural-Anthropogenic River Systems in the Pre-Carpathian Region*: Monograph / Yushchenko Yu.S. et al.; edited by Yu.S. Yushchenko. Chernivtsi: Yuriy Fedkovych Chernivtsi National University, 2017. 472 p. 2. *General Hydrology*: Textbook. Chernivtsi: Yuriy Fedkovych Chernivtsi National University, 2017. 591 p. 3. Yushchenko Yu. *Problems of Socio-Economic-Geographical and Hydroecological Studies of River Channels and Floodplains*. Scientific Bulletin of Chernivtsi University. Series: Geography. 2018. Issue 795. P. 102–108. 4. Snizhko S., Trypolska H., Yushchenko Yu., et al. *Technical Needs Assessment of the Water Sector to the Adaptation to Climate Change in Ukraine*. Hydrology, Hydrochemistry and Hydroecology. 2019. No. 3 (54). P. 98–99. 5. Yushchenko Yu.S. *Water Protection Lands*. In: *Problems of Hydrology, Hydrochemistry, Hydroecology*. Kyiv: Nika-Center, 2019. P. 32–39. 6. *The Young Landscape of the Prut River: Past and Present (within Chernivtsi Region)*: Monograph /	Ukrainian Hydrometeorological Institute, Department of System Hydrometeorological Research Topic: "Exchange of Experience in River Basin Management Planning and Its Hydroecological Justification" Certificate No. 65 dated 13.12.2019

					Yushchenko Yu.S. et al.; edited by Yu.S. Yushchenko. Chernivtsi: FOP Sadovskyi S.S., 2019. 115 p. 7. Zyhar A., Savchyn I., Yushchenko Y., Pasichnyk M. *Analysis of Inclinometric Observations and Prediction of Soil Deformations in the Area of the Dnister PSPP*. JGD. 2021; Vol. 1(30), No. 1(30): 17–24. 8. Yushchenko Yu., Pasichnyk M., Bilokon M., Nikolaiev A., Mykytchyn O. *Research on the Current State of Anthropogenic Transformation of the Young River Landscape of the Prut (within Chernivtsi Region)*. Scientific Bulletin of Chernivtsi University. Geography. 2020. Issue 824. P. 55–63. 9. Nikolaiev A., Yushchenko Yu., Pasichnyk M. *Local Earthquakes as a Component of Seismic Hazard in Chernivtsi Region*. Scientific Bulletin of Chernivtsi University. Series: Geography. 2020. Issue 826. P. 4–9. 10. *Hydrology: Collection of Educational Programmes for Educational Components of the Professional Programme* / comp. by Yushchenko Yu.S. et al. Chernivtsi: FOP Sadovskyi S.S., 2021. 96 p. 11. *Course, Bachelor's and Master's Theses: Methodological Recommendations for Students of the Specialty 103 "Earth Sciences"* / comp. by Palanychko O.V., Yushchenko Yu.S., Pasichnyk M.D., et al. Chernivtsi: FOP Sadovskyi S.S., 2021. 69 p. 12. *Methodology of Teaching Geographical and Hydrological Disciplines in Higher Education*: Methodical Recommendations / comp. by Palanychko O.V., Kyryliuk A.O., Yushchenko Yu.S., et al. Chernivtsi: FOP Sadovskyi S.S., 2021. 51 p. 13. Yushchenko Yu., Palanychko O., Pasichnyk M., Zakrevskyi O. *The Influence of Atmospheric Precipitation on the Runoff of the Putyla River*. Scientific Notes of Ternopil National Pedagogical University named after Volodymyr Hnatyuk. Series: Geography. Ternopil, 2021. No. 2 (Issue 51). P. 24–29. **Professional and Scientific Memberships and Roles:** • Member of the Specialized Academic Council (K 76.051.04) of the Faculty of Geography at Yuriy Fedkovych Chernivtsi National University • Member of the Specialized Academic Council (D	

					41.090.01) at Odesa State Environmental University • Appointed as an expert for licensing and accreditation commissions in accordance with the Cabinet of Ministers of Ukraine's resolution on licensing educational services • Editorial board member of the *Scientific Bulletin of Chernivtsi National University*. Series: "Geography" • Former Chairman of the Scientific and Technical Council; Member of the Dniester Basin Council • Member of the Prut and Siret Basin Council • Member of the Scientific and Technical Council of Vyzhnytskyi National Nature Park and the Scientific Council under the Department of Ecology and Natural Resources of the Chernivtsi Regional State Administration • Honoured Worker of the Ukrainian Hydrometeorological Service • Expert of the National Ecocenter of Ukraine • Regular participant in national and international scientific and practical conferences • Head of a scientific school; supervises Master's and PhD students (7 PhD theses defended)	
Members of the Project Group						
Andrii Mykolaiovych Nikolaiev	Associate Professor of the Department of Hydrometeorology and Water Resources Yuriy Fedkovych Chernivtsi National University	Chernivtsi State University, 1977 "Geography" Geographer – Teacher of Geography Diploma No. B-1 535834 dated 22.06.1977	Candidate of Geographical Sciences, specialty 11.00.11 – "Constructive Geography and Rational Use of Natural Resources" Diploma No. DK 068024 dated 31.05.2011 Candidate dissertation topic: "Hydrological and Geochemical Assessment of the State of Rivers in	32	**Experience in Scientific and Pedagogical and/or Research Work:** Items 3, 4, 11, 14, 19 **Information on Scientific Activity:** 1. Nikolaiev A.M. *Hydrological and Hydrochemical Regimes of Small Rivers in Urbanized Areas*: Monograph. Chernivtsi: Yuriy Fedkovych Chernivtsi National University, 2016. 156 p. 2. Nikolaiev A.M. *Current Trends in Climate Aridity Changes in the Carpathian-Podilskyi Region of Ukraine*. Scientific Bulletin of Chernivtsi University. Series: Geography. 2016. Issues 775–776. P. 73–78. 3. *Hydroecological Justification of Safe and Balanced Development of Natural-Anthropogenic River Systems in the Pre-Carpathian Region*: Monograph / Yushchenko Yu.S. et al.; edited by Yu.S. Yushchenko. Chernivtsi: Yuriy Fedkovych Chernivtsi National University, 2017.	National University of Water and Environmental Engineering, Institute of Postgraduate Education Topic: "General Hydrology. Urban Hydrology" Certificate No. 018-2866/2020 dated 15.04.2020.

			an Urbanized Area (Case Study: Chernivtsi City)" Associate Professor of the Department of Hydroecology, Water Supply and Wastewater Disposal Certificate No. 12DC 039689 dated 12.06.2014.		472 p. 4. Nikolaiev A.M. *Interdaily Temperature Variability and Mortality from Circulatory System Diseases in the Chernivtsi Region*. Scientific Bulletin of Chernivtsi University. Series: Geography. 2017. Issue 785. P. 22–26. 5. *The Young Landscape of the Prut River: Past and Present (within Chernivtsi Region)*: Monograph / Yushchenko Yu.S. et al.; edited by Yu.S. Yushchenko. Chernivtsi: FOP Sadovskyi S.S., 2019. 115 p. 6. Yushchenko Yu., Pasichnyk M., Bilokon M., Nikolaiev A., Mykytchyn O. *Study of the Current State of Anthropogenic Transformation of the Young River Landscape of the Prut (within Chernivtsi Region)*. Scientific Bulletin of Chernivtsi University. Geography. 2020. Issue 824. P. 55–63. 7. Nikolaiev A., Yushchenko Yu., Pasichnyk M. *Local Earthquakes as a Component of Seismic Hazard in the Chernivtsi Region*. Scientific Bulletin of Chernivtsi University. Series: Geography. 2020. Issue 826. P. 4–9. 8. *Hydrology: Collection of Educational Programmes for the Educational Components of the Professional Programme* / comp. by Yushchenko Yu.S., Palanychko O.V., Pasichnyk M.D., Nikolaiev A.M., Nastiuk M.H. Chernivtsi: FOP Sadovskyi S.S., 2021. 96 p. 9. *Course, Bachelor's and Master's Theses: Methodological Recommendations for Students of Specialty 103 "Earth Sciences"* / comp. by Palanychko O.V., Yushchenko Yu.S., Pasichnyk M.D., et al. Chernivtsi: FOP Sadovskyi S.S., 2021. 69 p. 10. *Methodology for Teaching Geographical and Hydrological Disciplines in Higher Education*: Methodical Recommendations / comp. by Palanychko O.V., Kyryliuk A.O., Yushchenko Yu.S., et al. Chernivtsi: FOP Sadovskyi S.S., 2021. 51 p. **Other Scientific and Professional Roles:** • Regular participant in national and international scientific and practical conferences • Supervisor of student and master's research • Hydrological engineer, Director and Scientific Consultant of the Educational and Scientific Geophysical	

					Observatory of Chernivtsi National University	
Olha Viktorivna Palanychko	Associate Professor of the Department of Hydrometeorology and Water Resources Yuriy Fedkovych Chernivtsi National University	Yuriy Fedkovych Chernivtsi National University, 2006 "Ecology and Environmental Protection" Master of Ecology Diploma No. RN 30288881 dated 20.06.2006	Candidate of Geographical Sciences, specialty 11.00.07 – "Land Hydrology, Water Resources, Hydrochemistry" Diploma No. DK 060202 dated 26.05.2010 Candidate dissertation topic: "Patterns of River Channel Formation in the Pre-Carpathian Region" Associate Professor of the Department of Hydroecology, Water Supply and Wastewater Disposal Certificate No. 12DC 034199 dated 25.01.2013	15	**Experience in Scientific and Pedagogical and/or Research Work:** Items 3, 4, 11, 12, 14, 19 **Information on Scientific Activity:** 1. *Hydroecological Justification of Safe and Balanced Development of Natural-Anthropogenic River Systems in the Pre-Carpathian Region*: Monograph / Yushchenko Yu.S. et al.; edited by Yu.S. Yushchenko. Chernivtsi: Yuriy Fedkovych Chernivtsi National University, 2017. 472 p. 2. *Physical Oceanography*: Textbook / comp. by M.D. Pasichnyk, O.V. Palanychko. Chernivtsi: Yuriy Fedkovych Chernivtsi National University, 2019. 124 p. 3. *Hydrology: Collection of Educational Programmes for Educational Components of the Professional Programme* / comp. by Yushchenko Yu.S., Palanychko O.V., Pasichnyk M.D., Nikolaiev A.M., Nastiuk M.H. Chernivtsi: FOP Sadovskyi S.S., 2021. 96 p. 4. *Course, Bachelor's and Master's Theses: Methodological Recommendations for Students of Specialty 103 "Earth Sciences"* / comp. by Palanychko O.V., Yushchenko Yu.S., Pasichnyk M.D., et al. Chernivtsi: FOP Sadovskyi S.S., 2021. 69 p. 5. *Methodology for Teaching Geographical and Hydrological Disciplines in Higher Education*: Methodical Recommendations / comp. by Palanychko O.V., Kyryliuk A.O., Yushchenko Yu.S., et al. Chernivtsi: FOP Sadovskyi S.S., 2021. 51 p. 6. Yushchenko Yu., Palanychko O., Pasichnyk M., Zakrevskyi O. *Influence of Atmospheric Precipitation on the Runoff of the Putyla River*. Scientific Notes of Ternopil National Pedagogical University named after Volodymyr Hnatyuk. Series: Geography. Ternopil, 2021. No. 2 (Issue 51). P. 24–29. 7. Palanychko O.V. *Every Drop Matters. March 22 – World Water Day*. Nashe Prydnistrovia. March 22, 2019. No. 12 (9560). P. 2. 8. Palanychko O.V. *Water and Climate Change. March 22 – World Water Day*. Slovo Pravdy. March 20, 2020. No. 12 (8213). P. 7.	National University of Water and Environmental Engineering, Institute of Postgraduate Education Topic: "Modern Approaches and Methods of Teaching Hydrological Disciplines in Higher Education Institutions. Specifics of Teaching the Discipline 'Methodology and Organization of Scientific Research' in HEIs" Certificate No. 018-3000/21 dated 15.12.2021

					9. Palanychko O.V. *The Value of Water. March 22 – World Water Day*. Slovo Pravdy. March 19, 2021. No. 11 (8266). P. 3. 10. Palanychko Olha. *Do We Need Hydrometeorologists in Modern Society?* Vilne Zhyttia. October 21, 2021. No. 43 (8356). P. 8. 11. Palanychko Olha. *Why Are Hydrometeorologists So Necessary for Modern Society?* (Dedicated to the 100th anniversary of the Ukrainian Hydrometeorological Service). Khotynski Visti. November 19, 2021. No. 47 (8009). P. 2. **Other Scientific and Professional Roles:** • Participates in national and international scientific and practical conferences • Supervises research of students and master's students	
Mykola Dmytrovych Pasichnyk	Associate Professor of the Department of Hydrometeorology and Water Resources Yuriy Fedkovych Chernivtsi National University	Yuriy Fedkovych Chernivtsi National University, 2006 "Ecology and Environmental Protection" Master of Ecology Diploma No. RN 29724848 dated 20.06.2006	Candidate of Geographical Sciences, specialty 11.00.07 – "Land Hydrology, Water Resources, Hydrochemistry" Diploma No. DK 010475 dated 30.11.2012 Candidate dissertation topic: "Geo-hydromorphological Analysis of the Territorial Structure of Valley Floors of the Main Rivers in the Chernivtsi Region" Associate Professor of the Department of Hydrometeorology and Water	15	**Key scientific and academic activities (items 3, 4, 8, 11, 14, 15, 19):** 1. *Hydroecological Justification for the Safe and Balanced Development of River Natural-Anthropogenic Systems of Precarpathia*: monograph / Yushchenko Yu.S., Honchar O.M., Hryhorychuk V.V., Karavan Yu.V., Kostenyuk L.V., Nastiuk M.H., Nikolaiev A.M., Palanychko O.V., Pasichnyk M.D., Shevchuk A.Yu., Shevchuk Yu.F., Yushchenko O.Yu.; Ed. by Yu.S. Yushchenko. Chernivtsi: Yuriy Fedkovych Chernivtsi National University, 2017. 472 p. 2. Pasichnyk M., Mykytchyn O. Optimization of Land Use Structure of the Berezhnytsia River Basin Geosystem According to Orographic Conditions (Using GIS). *Scientific Bulletin of Chernivtsi University. Series: Geography*. 2018. Issue 803. pp. 120–126. 3. *The Young Landscape of the Prut River: Past and Present (within Chernivtsi Region)*: monograph / Yushchenko Yu.S., Pasichnyk M.D., Bilokon M.V., Hryhorychuk V.V., Nikolaiev A.M., Sivak V.K., Shevchuk Yu.F.; Ed. by Yu.S. Yushchenko. Chernivtsi: FOP Sadovskyi S.S., 2019. 115 p. 4. *Physical Oceanology*: textbook / Compiled by M.D. Pasichnyk, O.V. Palanychko. Chernivtsi: Yuriy Fedkovych Chernivtsi National University, 2019. 124 p.	Collegium Civitas (Warsaw, Poland), topic: "Internationalization of Higher Education. Organization of the Educational Process and Innovative Teaching Methods in Higher Education Institutions in Poland", certificate No. 112/2020 dated December 18, 2020.

			Resources Certificate No. AD 011038 dated 01.02.2022		5. Yushchenko Yu., Pasichnyk M., Bilokon M., Nikolaiev A., Mykytchyn O. Research of the Current State of Anthropogenic Transformation of the Young River Landscape of the Prut (within Chernivtsi Region). *Scientific Bulletin of Chernivtsi University. Series: Geography*. Chernivtsi, 2020. Issue 824. pp. 55–63. 6. Nikolaiev A., Yushchenko Yu., Pasichnyk M. Local Earthquakes as a Component of Seismic Risk in the Chernivtsi Region. *Scientific Bulletin of Chernivtsi University. Series: Geography*. 2020. Issue 826. pp. 4–9. 7. *Hydrology: Collection of Educational Programs for Educational Components of the Educational-Professional Program* / Compiled by: Yushchenko Yu.S., Palanychko O.V., Pasichnyk M.D., Nikolaiev A.M., Nastiuk M.H. Chernivtsi: FOP Sadovskyi S.S., 2021. 96 p. 8. *Course, Bachelor's, and Master's Theses: Methodical Recommendations for Higher Education Students Specializing in 103 "Earth Sciences"* / Compiled by: Palanychko O.V., Yushchenko Yu.S., Pasichnyk M.D. et al. Chernivtsi: FOP Sadovskyi S.S. 2021. 69 p. 9. *Methodology of Teaching Geographical and Hydrological Disciplines in Higher Education*: methodical recommendations / Compiled by: Palanychko O.V., Kyryliuk A.O., Yushchenko Yu.S. et al. Chernivtsi: FOP Sadovskyi S.S. 2021. 51 p. 10. Demchyk K., Pasichnyk M., Pozharytska O., Parfeniuk I., Tonkykh O. Pedagogical Aspects of Students' Digital Competence Development. *Laplage em Revista*. Vol. 7 No. Extra-A (2021): Jan./Apr. pp. 471–480. 11. Zyhar A., Savchyn I., Yushchenko Y., Pasichnyk M. Analysis of Inclinometric Observations and Prediction of Soils Deformations in the Area of the Dnister PSPP. *Journal of Geodesy and Geoinformatics (JGD)*. 2021. Vol. 1(30), No. 1(30). pp. 17–24. 12. Yushchenko Yu., Palanychko O., Pasichnyk M., Zakrevskyi O. The Influence of Atmospheric Precipitation on the Runoff of the Putyla River. *Scientific Notes of Ternopil National Pedagogical University named after Volodymyr Hnatiuk. Series: Geography*. Ternopil, 2021. No. 2 (Issue 51). pp. 24–29. **Additional academic and professional activities:** • Participant in international and national scientific and	

					scientific-practical conferences. • Supervisor of students' and master's scientific work. • Coordinator of EU-Ukraine international technical assistance projects. • Member of the Regional Commission for Evaluation and Competitive Selection of Regional Development Investment Programs and Projects.	

External Stakeholder Reviews (if available):
(http://www.hydroecology.chnu.edu.ua/index.php?page=ua/11op/01bakalavr):

1. Chernivtsi Regional Hydrometeorological Center (April 14, 2020)
2. Basin Department of Water Resources of the Prut and Siret Rivers (Incoming No. 4/428 dated July 5, 2021)
3. Department of Ecology and Natural Resources of the Chernivtsi Regional State Administration (Incoming No. 01/845 dated July 7, 2021)

Educational Program Profile
"Hydrology"
within Specialty 103 “Earth Sciences”

1 - General Information	
Full name of the higher education institution and structural unit:	Yuriy Fedkovych Chernivtsi National University Faculty of Geography Department of Hydrometeorology and Water Resources
Higher education degree and qualification title in the original language:	Degree of Higher Education – Master Field of Knowledge – 10 Natural Sciences Specialty – 103 “Earth Sciences” Qualification: Master of Earth Sciences (Hydrology)
Official name of the educational program:	Hydrology
Degree type and volume of the educational program:	Master’s degree, single diploma, 90 ECTS credits, duration of study: 1.4 years
Accreditation status:	The educational program was launched in 2017; accredited by the National Agency for Higher Education Quality Assurance (Ukraine); next scheduled accreditation: 2027.
Cycle/Level:	NQF of Ukraine – Level 8, FQ-EHEA – Second cycle, EQF-LLL – Level 7
Prerequisites:	Bachelor’s degree / Specialist qualification
Language(s) of instruction:	Ukrainian
Validity period of the educational program:	Until 01.07.2027
Internet address of the permanent placement of the educational program description:	http://geo.chnu.edu.ua/index.php?page=ua/051specialties http://www.hydroecology.chnu.edu.ua/index.php?page=ua/11op/02magistr
2 – Purpose of the Educational Program	
To provide students with the knowledge, skills, and understanding related to the fields of Earth Sciences, as well as other competencies within the specialization "Hydrology," thereby enabling them to carry out professional activities independently. The program aims to prepare graduates for the successful pursuit of more advanced academic and research programs in hydrology, and to become scientific managers in the field of sustainable water resources use. It offers an education in Earth Sciences that ensures broad access to employment opportunities and is designed to prepare students with a particular interest in hydrology and water resources management.	
3 – Characteristics of the Educational Program	
Subject Area (Field of Knowledge, Specialty, Specialization if applicable):	Field of Knowledge – 10 "Natural Sciences" Specialty – 103 "Earth Sciences" Educational Program (EP) – "Hydrology" **Structure of the Educational Program:** Compulsory academic modules constitute **73.3%** of the program, including: – General training disciplines – **25.8%** – Professional training disciplines – **47%**

	– Practical training – **27.2%** The block of elective disciplines comprises **26.7%**, including: – Modules aimed at expanding general competencies – **50%** – Modules aimed at expanding professional competencies – **50%**
Program Orientation	The program is educational and professional in nature. According to the ISCED (International Standard Classification of Education), it has an applied orientation. The program is designed to provide students with both theoretical and practical knowledge that will form the core competencies necessary for performing various tasks in institutions related to hydrological activities, the rational use of water resources, and environmental protection.
Main Focus of the Educational Program and Specialization	The program provides a general education in the field of Earth Sciences, along with specialized education and professional training in the domain of hydrology and water resource management. **Keywords:** hydrology, water resources, management, hydroecology.
Program Features	A portion of the professional-oriented courses and practical training is conducted on the basis of institutions and organizations that are engaged in hydrological research and water resource management.
4 – Employability and Further Education Opportunities of Graduates	
Employability	A Master's degree holder in Earth Sciences (Hydrology) is qualified to perform functions and solve tasks within universities or research institutions (as a university lecturer or assistant), in scientific positions within the field of Earth Sciences (as a research associate), and in the sphere of water resources management. Graduates may also hold entry-level positions within the system of the State Hydrometeorological Service, the State Hydrographic Service, the State Agency of Water Resources of Ukraine, the Ministry of Ecology and Natural Resources, the Ministry of Emergency Situations and Affairs of Population Protection from the Consequences of the Chernobyl Catastrophe, and the Ministry of Agrarian Policy.
Further Education	Graduates have the right and opportunity to continue their education through third-cycle (educational and scientific) higher education programs, including postgraduate (PhD) and doctoral studies.
5 – Teaching and Assessment	
Teaching and Learning	Student-centered learning, self-directed learning, problem-based learning, among others. The system of teaching methods is based on the principles of purposefulness and binarity — active direct involvement of both the teacher and the student. The key approaches to teaching and learning include humanism, student-centeredness, and systematicity. The educational process combines lectures and practical classes with solving situational tasks and the use of business games and training sessions that develop leadership skills and the ability to work in a team, consultations with instructors, and the writing of scientific papers.

Assessment	Ongoing assessment includes quizzes, test control, presentations of individual assignments, internship reports, and defence of course projects. Final assessment consists of exams and credits based on the cumulative scores from ongoing assessment. State certification includes the preparation and defence of the final qualification thesis.
6 – Programme Competencies	
Integral competence	The ability to solve complex specialized tasks and practical problems in professional activities within the subject area of Earth sciences or in the course of study, using modern theories and research methods of natural and anthropogenic objects and processes, applying a range of interdisciplinary data and under conditions of limited information.
General Competencies (GC)	**GC 01.** Ability to adapt and act in new situations. **GC 02.** Ability to identify, define, and solve problems. **GC 03.** Ability to communicate with representatives of other professional groups at different levels (with experts from other fields of knowledge/economic activities). **GC 04.** Ability to work in an international context. **GC 05.** Ability to act in a socially responsible and conscious manner.
Special (Professional) Competencies (PC)	**PC 01.** Understanding the necessity of complying with copyright and related intellectual property rights; awareness of national and international systems of intellectual property protection. **PC 02.** Knowledge of modern principles of nature management, interaction between nature and society through the application of rational use of natural resources, environmental aspects, and the basics of environmental legislation. **PC 03.** Understanding the planet as a unified system and the major issues of its structure and development. **PC 04.** Proficiency in modern research methods used in production and scientific-research institutions for studying the Earth, its geospheres, and their components. **PC 05.** Ability to apply knowledge and necessary practical skills in planning, organizing, motivating, controlling, and regulating the activities of specialized enterprises and institutions. **PC 06.** Ability to apply scientific knowledge and implement it in practice for the development and implementation of mechanisms for geoplanning, territorial planning, regional development monitoring, and the creation of strategic plans and programs. **PC 07.** Knowledge of the main contemporary principles of hydrological science and fundamental sciences related to the development of the Earth, surface waters, and Earth evolution, and the ability to apply them to form a worldview and approach to water resource management. **PC 08.** Ability to identify and analyze major anthropogenic impacts on water bodies, related landscapes, and river basins; to assess the hydroecological state of these objects and address hydroecological safety issues.
7. Learning Outcomes (LO)	

Program Learning Outcomes (PLO)	**PLO 1.** Analyze the characteristics of natural and anthropogenic systems and objects within the Earth's geospheres. **PLO 2.** Apply knowledge to identify and solve problems and make well-grounded decisions in Earth sciences. **PLO 3.** Communicate with specialists and experts from various fields, including in international contexts and within the global information environment. **PLO 4.** Design, manage, and lead projects in Earth sciences, assess and ensure the quality of work. **PLO 5.** Plan and conduct scientific experiments and write scientific papers in the field of specialization. **PLO 6.** Perform environmental assessments, audits, licensing, and certification of natural resource use; forecast ecological, technological, economic, and social consequences of nature management at specific sites. **PLO 7.** Know and be able to apply modern methods of Earth and geosphere research in both production and scientific research activities. **PLO 8.** Understand the basic principles of managing enterprises in the field of nature management, their organization, and production and organizational management structures. **PLO 9.** Develop and implement mechanisms of territorial management and geoplanning, monitor regional development, and create strategic plans and programs. **PLO 10.** Solve practical problems in Earth sciences (by specialization) using theories, principles, and methods from various disciplines in the natural sciences. **PLO 11.** Use modern modeling methods and geoinformation processing in the implementation of innovative activities. **PLO 12.** Independently plan the implementation of innovative tasks and formulate conclusions based on the results. **PLO 13.** Assess the ecological and economic impact on the environment during the implementation of engineering measures and design environmental protection actions. **PLO 14.** Participate in the development of river basin management plans using knowledge from relevant hydrological disciplines. **PLO 15.** Apply knowledge of the legal foundations of integrated water resources management, particularly international agreements and the implementation of the EU Water Framework Directive.
8 – Resource Support for Programme Implementation	
Staffing Support	The composition of the educational programme’s project team and the academic staff involved in teaching the specialty courses comply with the Licensing Conditions for conducting educational activities at the second (master's) level of higher education.

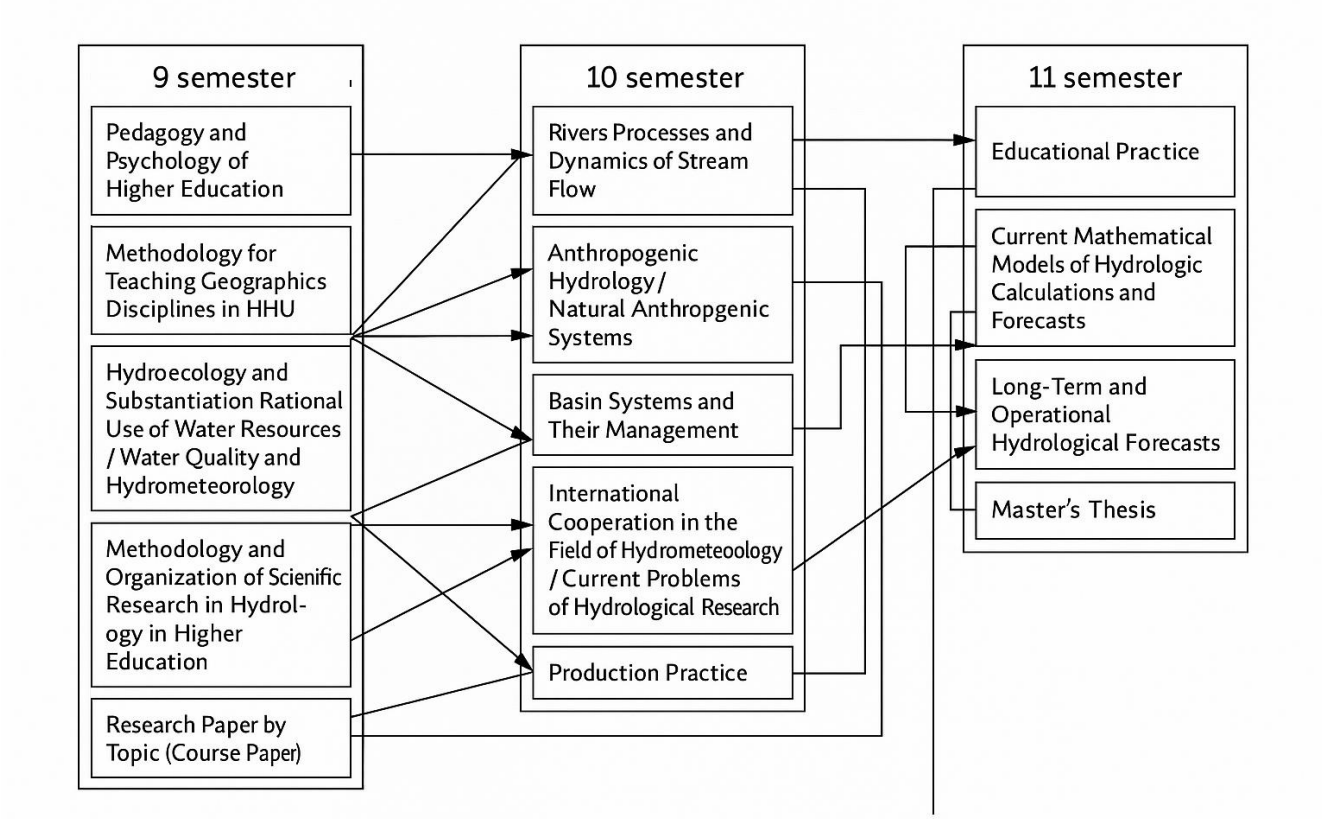
Material and Technical Support	The equipment and tools necessary for field and laboratory research of hydrometeorological systems, educational technical means (whiteboards, multimedia projectors, laptops, printers, scanners, personal computers with software) are provided for the development of subject-specific competences in Earth sciences (hydrometeorology) during the educational process. There are classrooms, laboratories, computer rooms, a dormitory, and dining facilities.
Information and Educational-Methodical Support	The official website of Yuriy Fedkovych Chernivtsi National University, the faculty's website, and the website of the Department of Hydrometeorology and Water Resources provide unrestricted Internet access. Information sources include printed materials (the university library collections, institutional repository, departmental materials, and cartographic works) as well as online resources (including the CNU E-learning Center). Educational and working curricula (with explanatory notes), educational programs, course and internship syllabi, and educational-methodical packages are available. These include lecture content, practical work assignments, seminar questions, and developed syllabi.
9 – Academic Mobility	
National Credit Mobility	Agreements on academic mobility based on bilateral contracts between Yuriy Fedkovych Chernivtsi National University and higher education institutions.
International Credit Mobility	Agreements on international academic mobility (Erasmus+ KA1) based on bilateral contracts between Yuriy Fedkovych Chernivtsi National University and partner country institutions.
Education of International Students	Not envisaged.

1. List of Components of the Educational and Professional Program "Hydrology" and Their Logical Sequence

2. List of Program Components

Code / ID	Components of the Educational Program *(academic disciplines, course projects (papers), internships, qualification work)*	Number of Credits	Form of Final Assessment
Обов'язкові компоненти ОП			
GTC 1	Channel Studies and Flow Dynamics	6,0	Exam
GTC 2	Modern Mathematical Models in Hydrological Calculations and Forecasting	3,0	Assessment
GTC 3	Pedagogy and Psychology of Higher Education	3,0	Exam
GTC 4	*Methods of Teaching Geographic Disciplines in Higher Education Institutions*	5,0	Exam
PTC 1	River Basin Systems and Their Management	6,0	Exam
PTC 2	Methodology and Organization of Scientific Research in Hydrology	4,0	Assessment
PTC 3	Long-term and Operational Hydrological Forecasts	3,0	Exam
PTC 4	Assistantship (Teaching Practice)	12,0	Assessment
PTC 5	Professional Internship	6,0	Assessment
PTC 6	Research Project on a Selected Topic (Course Paper)	6,0	Assessment
PTC 7	Master's Thesis / Final Qualification Work	12,0	Assessment
Total Volume of Compulsory Components:		**66,0 / 73,3%**	
Elective Components of the Educational Program			
EC 1	**Elective Block №1** **(*mandatory choice of 12.0 ECTS credits, two courses*)**		
	– Anthropogenic Hydrology – Natural-Anthropogenic Water Systems – Hydroecology and Sustainable Use of Water Resources – Water Quality and Hydroecological Safety	6,0 6,0 6,0 6,0	Assessment Assessment Exam Exam
EB 1	**Elective Block №2** **(*mandatory choice of 12.0 ECTS credits, one course*)**		
	- International Cooperation in the Field of Hydrometeorology - Contemporary Issues in Hydrological Research - Computer and Internet Technologies in Hydrology - Advanced Methods of Hydrological Data Analysis	6,0 6,0 6,0 6,0	Assessment Assessment Exam Exam
Total Scope of Elective Components:			**24,0 / 26,7%**
Total Number of ECTS Credits			**90,0**

2. Structural and Logical Scheme of the Educational Programme



3. Form of Certification of Higher Education Applicants

The certification of graduates of the educational program "Hydrology" under specialty 103 "Earth Sciences" is carried out in the form of a public defense of the Master's qualification thesis and culminates in the issuance of a state-recognized document conferring the degree of Master in Earth Sciences (Hydrology), educational program – "Hydrology."

The certification process is conducted openly and publicly.

The qualification thesis must include a review of relevant literature and present the results of the student's independent and creative work with data and materials obtained and processed personally.

Requirements for the Master's Qualification Thesis:
The thesis must be original (with a plagiarism check conducted according to the procedure outlined at: https://drive.google.com/file/d/16eJk4gKG5oJII2ot4UeSq2BSgadrPl/view), creative in nature, contain elements of scientific research, and be completed independently. The work must also demonstrate practical relevance.

4. Matrix of Correspondence Between Programme Competencies and Educational Programme Components

	GCB 1	GCB 2	GCB 3	GCB 4	PCB 1	PCB 2	PCB 3	PCB 4	PCB 5	PCB 6	PCB 7	EC 1	EB 1
GC 01			+	+		+							
GC 02						+		+	+	+	+		
GC 03					+	+							
GC 04												+	+
GC 05			+	+				+					
PC 01						+			+	+	+		
PC 02	+	+			+			+					
PC 03						+		+					
PC 04	+	+			+	+	+		+	+	+	+	+
PC 05					+		+						
PC 06					+							+	+
PC 07	+	+			+	+	+	+	+	+	+	+	+
PC 08	+	+			+		+			+	+	+	+

5. Matrix of Ensuring Programme Learning Outcomes (PLOs) by Corresponding Educational Programme Components

	GCB 1	GCB 2	GCB 3	GCB 4	PCB 1	PCB 2	PCB 3	PCB 4	PCB 5	PCB 6	PCB 7	EC 1	EB 1
PLO 1	+	+			+	+			+	+	+	+	+
PLO 2			+	+	+	+		+					
PLO 3			+	+	+	+	+	+	+		+	+	+
PLO 4						+							
PLO 5						+			+	+	+		
PLO 6												+	+
PLO 7	+	+				+	+	+	+	+	+	+	+
PLO 8					+								
PLO 9					+								
PLO 10	+	+				+	+					+	+
PLO 11		+					+					+	+
PLO 12			+	+									
PLO 13					+							+	+
PLO 14	+				+								
PLO 15					+	+	+					+	+