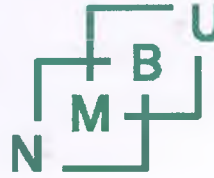




Direktoratet for
Internasjonalisering
og kvalitetsutvikling
i høyere utdanning



Norwegian University
of Life Sciences

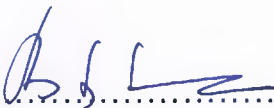
Certificate of Completion

is awarded to

Prof. Oleksandr Kvartenko

National University of Water and Environmental Engineering

for participation in the **Staff Professional Development Training Program**
“**Innovative Pedagogy in Water Educational Programs of the Higher School**” of
Water Harmony Project, co-funded by the Norwegian Agency for International
Cooperation and Quality Enhancement in Higher Education, 2020-2022.
(list of trainings enclosed)


.....

Harsha Ratnaweera, PhD
Project Manager – Water Harmony - II
Professor in Water & Wastewater Treatment
Faculty of Sciences and Technology
Norwegian University of Life Sciences
P O Box 5003, 1432 Ås,
Norway



Water Harmony
Eurasia-II

14th June 2022
No 0058

Staff Professional Development Training Program
2020-2022
40 hours

№	Lectures and Training Sessions	Dates	Hours
1	Lecture. Digitalization of higher education: - Introduction and structure of the professional development program - Status and trends in the digital transformation of the education sector - Online learning management systems (LMS) - Online active learning tools Prof. H. Ratnaweera, Dr. Z. Maletsky, Norwegian University of Life Sciences (Ås, Norway)	21-05-2020	3.0
2	Lecture. Modern methods of active learning: - Active Learning Methods: Overview and Trends - Cooperative learning (I-You-We techniques) - Minute Paper Technique - Mutual learning (Peer Learning, Stump Your Partner, Catchup techniques) - Problem based learning Prof. H. Ratnaweera, Dr. Z. Maletsky, Norwegian University of Life Sciences (Ås, Norway)	08-06-2020	3.0
3	Lecture. Modern analytical methods for the study of water and materials: - Review of analytical methods: spectroscopy, mass spectrometry, chromatography Dr. Z. Maletsky, Norwegian University of Life Sciences (Ås, Norway) Virus analysis and research, including SARS Prof. V. Tarabara, Michigan State University (Lensing, USA) Raman spectroscopy and fluorescence Prof. I. Chernyshova, Columbia University (New York, USA) IR spectroscopy and scanning electron microscopy Prof. G. Korshin, University of Washington (Seattle, USA)	08-07-2020	4.0
4	Lecture. Online water quality measurements in the treatment process: - The need for online monitoring - Water sampling: methods, possible errors, equipment - Real-time physical sensors: UV-visible absorption; Ion selective electrodes - Auto-analyzers: Flow injection analysis/sequential injection analysis; Microanalyzers, lab-on-a-chip analyzer - Virtual sensors (soft sensors, proxy settings) - Practical tasks and potential - Trends and technological developments Prof. H. Ratnaweera, Dr. Z. Maletsky, Norwegian University of Life Sciences (Ås, Norway), Prof. S. Kalinowski, Warmia-Mazury University (Olsztyn, Poland)	30-10-2020	3.0
5	Lecture. Building Information Modelling and Digital Twins: - Building Information Modelling (BIM) - Digital twins Prof. H. Ratnaweera, Norwegian University of Life Sciences (Ås, Norway), BIM Ing. O. Shelestina, Norsk Wavin (Oslo, Norway)	04-12-2020	2.5
6	Lecture. Circular Economy: - Linear economy and sustainable development - Circular economy in the water sector - Technologies for the reuse of water, energy and other valuable resources	09-06-2021	1.0

7	Dr. Z. Maletsky, Norwegian University of Life Sciences (Ås, Norway) Lecture. Challenges of the next decade and technological solutions: - Challenges of the next decade and technological solutions - New pollutants and their fate in water treatment	10-12-2021	2.0
8	Prof. H. Ratnaweera, Dr. Z. Maletsky, Norwegian University of Life Sciences (Ås, Norway) Lecture. Physical and cyber risks in the water sector Prof. H. Ratnaweera, Norwegian University of Life Sciences (Ås, Norway)	13-06-2022	1.5
9	Review lectures materials and tutorial of lab works	2020-2022	20.0

Total hours: **40**