Master in Water Resources Management

Program Outline

Students study a minimum of 28 credit hours in addition to a master thesis equivalent to 8 credit hours. Students can take up to 9 credit hours of specialized courses from other programs to serve his Master's thesis research upon the recommendation of the academic supervisor and approval of the Center's Council. Students are expected to earn their degrees within two academic years for the Master's degree.

Furthermore, the Center offers a post-graduate "United Nations University Diploma in Integrated Water Resources Management." The professional diploma is conducted in a mixed-mode (face-to-face and distance learning) and lasts for one year. Applicants awarded the UNU IWRM Diploma with good standing can enter directly to the MSc. degree.

Research areas include:

Impact of climate change on the water resources management system in the GCC countries (vulnerability assessment and options for adaptation)

Management of the Water-Energy-Food Nexus in the GCC countries (minimizing trade-offs and enhancing synergies)

Integrated Planning, Management, and modeling of the Water System in the GCC (coupling of socio-economic models and physical models)

Groundwater Planning and Management in the GCC countries (renewable and non-renewable groundwater: governance, technical, and institutional aspects)

Outline of Courses

A. Shared Courses

Course code	Course title	Credit hours
GSTS 510	Scientific Writing	1
GSTS 520	Research Methods	2

B. Specialized Courses

The requirement of these Basic courses in Molecular Medicine must reach at least 6 credit hours.

Course code	Course title	Credit hours
NRE 520	Environmental Impact Assessment	2
NRE 521	Water Resources Development & Management in Arid Regions	2
NRE 620	Natural Resources and Environmental Economics	2
NREWR 510	Seminar	1
NREWR 520	Quantitative Analysis	2
NREWR 530	Design of Irrigation and Drainage Systems	3
NREWR 531	Water Resources Planning and Management	3
NREWR 532	Urban Water Management	3
NREWR 533	Management of Irrigation and Drainage Systems	3
NREWR 534	Water Quality Management	3
NREWR 535	Integrated Water Resources Management	3
NREWR 5*9/6*9	Lab, field and case studies	-
NREWR 680	M.Sc. Thesis	8

C. Elective Courses

Course code	Course title	Credit hours
GEOGR 531	Geographic Information System	3
GEOGR 532	Remote Sensing	3
GEOGR 521	Geostatistics Analysis	2
NREES 534	Urban Environment Systems	3
NREES 631	Water, Environment, and Ecosystem	3

Note: NREWR 5*9/6*9 Lab, Field, and Case Studies. The * represents from 1 to maximum 4 credit hours

Courses description

1 to 4 CR	Lab, Field, and Case Studies	NREWR 5*9
Students may work on specific environmental problems/issues of particular interest to him/her, or in a specific field not covered by existing courses.		
1 CR	Seminar	NREWR 510
A student may research or investigate a topic and exchange results with other students through the presentations, reports, and discussions under the supervision of a faculty member.		
2 CR	Environmental Impact Assessment	NREWR 520
Overview of EIA, legal and institutional arrangements, public participation, screening, scoping, impact analysis, mitigation and impact assessment, reporting, review of EIA quality, decision-making, implementation, and follow-up.		
2 CR	Project Management	NREWR 521
Framework, quantitative methods, scope, time, cost, and quality; human resources, communication, risk, procurement, integration, and professional responsibility.		
3 CR	Design of Irrigation and Drainage Systems	NREWR 530

Design and implementation of irrigation schemes, Application of operation and management models for irrigation water management, optimization of productivity, and environmental protection, Design of horizontal and vertical drainage and water collection systems.		
3 RC	Water Resources Planning and Management	NREWR 531
Water Resources Systems Analysis, planning concepts within the framework of IWRM, Consideration of social, economic, financial, and environmental aspects, the planning process, situation analysis and modeling, Decision Support Systems.		
3 CR	Urban Water Management	NREWR 532
Urbanization, water-related SDGs; urban water supply and wastewater systems, WSS and health, Integrated Urban Water Management, urban water demands analyses, modeling, and management; artificial recharge of groundwater using urban treated wastewater; application of management models for the urban water system.		
3 CR	Management of Irrigation and Drainage Systems	NREWR 533
plant-soil-water relation under arid environment, Analytical and empirical methods for estimating soil moisture distribution under unsaturated and saturated zones, Integrated irrigation demand management measures, Simulation modeling, management of subsurface drainage system, Drainage water impact on the public health and the environment and monitoring measures. Reuse of drainage water in the irrigation sector, Stakeholder participation in the management of drainage system, Operation, and management of drainage systems through the application of drainage models.		
3 CR	Water Quality Management	NREWR 534
Types and sources of pollution, Physical/chemical and biological/bacteriological water characteristics and physicochemical processes, monitoring; measurement methods and data quality assurance represent, Water legislation, Risk assessment of anthropogenic pressures and impacts, Water quality monitoring, Water cleanup and treatment, Pollution risk assessment, monitoring strategy, Integrated basin management concepts; modeling water quality.		
3 CR	Integrated Water Resources Management	NREWR 535

Introduction to IWRM, water transfer, terrestrial ecosystem, aquatic ecosystem, aquatic ecosystem health and impact assessment, water use, wastewater, governance and community-based approach, organizational infrastructure and management, applying IWRM principles.		
1 to 4 CR	Lab, Field, and Case Studies	NREWR 6*9
Students may work on specific environmental problems/issues of particular interest to him/her, or in a specific field not covered by existing courses.		
8 CR	Master Thesis	NREWR 680
A student is expected to spend a total of 128 hours engaged in specified learning and assessment activities in the field of water resources. By the end of work, the student is expected to present a thesis that reflects a thorough understanding and analysis of the chosen topic using scientific methodologies.		