

**Sana'a University**  
**Faculty of Engineering**  
**Department Civil Engineering**



**Master of in Science**  
**Water and Environmental**  
**Engineering**

**Program**  
**Specifications**

**June - 2021**

**Faculty of Engineering, Sana'a University**

☎ 01464368, ☎ 01464365, ✉ m.albukhaiti@eng-su.edu.ye, 🌐 [www.eng-su.edu.ye](http://www.eng-su.edu.ye)

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

### 1. Program Introduction/Description

This program will specialize the civil engineer in Water and Environmental Engineering. Water and Environmental Engineering is a mixed program offering courses and research for a duration of up to three years. The program exposes students to the water quality control, water treatment and distribution, wastewater treatment and network, environmental engineering, hydrology, hydraulics, climate change, water structures and dams, Irrigation structure and methods, etc.....

It also provides students with research insights and the ability to perform research in the field of Water and Environmental Engineering.

### 2. Program Identification and General Information

Program Title	Master of Science in <b>Water and Environmental Engineering</b>
Awarding Institution	Sana'a University
Department	Department of Civil Engineering
Other Departments with major Teaching Contributions	NA
Language of study	English/ Arabic Language
Date of Specification Preparation/Revision	May 2021
Mode of Study	Full time
Study System	Courses & Thesis
Main Location of Study	Faculty of Engineering/Sana'a University
Mode of Delivery	Full-time
Study Duration	Minimum: 2 Academic years (Two terms each, full-time) Maximum: 3 Academic years (two terms each - full time)
Award(s) or Final Award	Master of Science (MSc.) in Water and Environmental Engineering
Qualification required to join the program:	BSc. in Civil Engineering or related fields
Minimum grade requirements to enroll in the program	Good
Other admission requirements	Detailed below
Name of the program coordinator	Prof. Fadhil Ali Al-Nozaily
Approval date:	

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

### 3. Program Curriculum Committee:

Prof. Fadhl Ali Al-Nozaily Prof. Abdulla Abdulkader Noaman Dr. Mansour Haiderah Dr. Zamzam Mubarak Dr. Sharafaddin Abdallah	Dr. Adnan Muharram Dr. Abdulwali Al-Sharjabi Dr Mohamed Abdulwadood Al-Areeki Dr. Mohammad Abdulla Algorafi
---	--

### 4. Vision, Mission & Aims of the University

#### Vision of the University

Sana'a University aspires to achieve a national leading role in teaching, learning, scientific research and community service; and to be among the best regional universities and the foremost house of expertise and think tank in Yemen.

#### Mission of the University

To contribute to the sustainable development efforts by providing an accredited higher education environment and excellent research services within a fruitful national partnership based on transparency, professionalism and creativity.

#### Aims of the University

The University seeks to achieve the following objectives:

- To provide specialized and in-depth academic opportunities for students in different fields of knowledge to meet the country's needs of specialties, technicians and experts, with special focus on the following:
  - To boost the level and quality of preparation and qualification tasks.
  - To create a general culture aiming at developing the elements of sound Islamic personality and the proper cognitive and scientific training.
  - To stabilize the true Islamic vision emanating from the broad horizons of Islamic knowledge and its perception of the universe, man and life.
  - To develop innovative and critical scientific thinking skills.
  - To provide students with the required knowledge and scientific and applied skills for solving problems effectively and efficiently.

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



## Program Specification

### 5. Vision, Mission & Aims of the Faculty

#### Vision of the Faculty

To excel in engineering education & scientific research with distinction at the local and regional levels.

#### Mission of the Faculty

To provide excellent and accredited engineering education to meet the development needs and match the labor market requirements locally and regionally.

#### Aims of the Faculty

1. To offer study programs in various fields of knowledge and equip students with required knowledge and scientific and know-how skills to utilize them in resolving problems effectively and efficiently.
2. To develop positive trends towards engineering science and its accelerating developments and enable students to use the techniques and methods of conducting scientific research in engineering fields.
3. To develop skills of scientific, innovative and critical thinking as well as the concept of continuous self-education.
4. To strengthen scientific ties with national and international colleges, scientific bodies, and research & development centers.
5. To provide technical and specialized studies and consultations to various state bodies and institutions, both public and semi-public, and utilize them in resolving the environment and society issues to promote sustainable development.
6. To develop a spirit of co-operation, group work, effective leadership, sense of responsibility, and ethical commitment.

### 6. Mission & Aims of the Department

#### Mission of the Department

To provide students with good quality Civil Engineering education that prepares them to be qualified and committed professionals who could pursue graduate studies and research and play a leading role in the sustainable development of the country and its integration into the regional economy.

#### Aims of the Department

1. provide a high-quality educational experience through an appropriate depth over the full range of core engineering subject areas for undergraduate and postgraduate programs,
2. applying the quality assurance standards and targeting the academic accreditation levels (local, regional and international levels).
3. Serving the community and labor market needs through the consultancy, research, laboratory tests and training services.
- 4.

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

### 7. Mission & Aims of the Program

#### Mission of the Program

To graduate distinguished Master holders in the field of Water and Environmental Engineering through a strong academic program, qualified staff, and suitable research infrastructure that meet local development requirements and labor market needs.

#### Aims of the Program

1. To provide specialized studies and encourage fundamental and applied research in different Water and Environmental Engineering disciplines.
2. To bridge the gap between the academic educational and industrial and technological environment.
3. To develop and improve the academic and educational level at the Faculty of Engineering in the field of Water and Environmental Engineering.
4. To provide graduates with up-to-date advanced knowledge and skills needed to attain excellence in solving technical problems and facing challenges in the Water and Environmental Engineering field.
5. To graduate researchers in Water and Environmental Engineering disciplines who can pursue further studies and contribute to the scientific research community.
6. To provide graduates able to effectively contribute to the Water and Environmental Engineering profession by applying ethical practices and communication skills, sharing innovative and clear ideas and pursuing further education through lifelong learning.

### 8. Program Standards & Benchmarks

#### Program Standards

- Rules and Regulations of the Ministry of Higher Education and Scientific Research, Yemen.
- Accreditation Board for Engineering and Technology (ABET)
- European Accreditation of Engineering Programmers (EUR-ACE)

#### Program Benchmarks

IHE-Delft-The Netherlands

Khalifa-Emirate

دمشق-Syria

Alexandria -Egypt

Stanford-USA

Jordanian- Jordan

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

### 9. Summary of Similar Programs (Benchmarks) for Water and Environmental Engineering Program

	The Similar Programs (Benchmarks)						Current Program
	1 <sup>st</sup> Program	2 <sup>nd</sup> Program	3 <sup>rd</sup> Program	4 <sup>th</sup> Program	5 <sup>th</sup> Program	6 <sup>th</sup> Program	
<b>Program Title</b>	Urban Water and Sanitation: Sanitary Engineering-Water Supply Engineering Urban Water Engineering and Management	MSc In Water and Environmental Engineering	ماجستير في الهندسة المائية ماجستير في الهندسة الصحية البيئية	هندسة الري و الهيدروليكا الهندسة الصحية	MSc. In Environmental Engineering specialized in Hydrology and water resources:	ماجستير في الهندسة المدنية- مياه وبيئة	Water and Environmental Engineering
<b>Faculty</b>	IHE Delft	College of Engineering	كلية الهندسة المدنية	كلية الهندسة	School of Eng.- civil and env. Eng.	كلية الهندسة	Engineering
<b>University</b>	IHE-Delft	Khalifa	دمشق	Alexandria	Stanford	Jordanian	Sana'a University
<b>Country</b>	The Netherlands	Emirate	Syria	Egypt	USA	Jordan	Yemen
<b>Type of Program</b>	Full-time, Master by Course and Research (International Master's Program)	Full-time, Master by Course and Research	Full-time, Master by Course and Research	Full-time, Master by Course and Research	Full-time, Master by Course and Research	Full-time, Master by Course and Research	Courses and Research
<b>Study methods in the program:</b>	Full-time	Full-time	Full-time	Full-time	Full-time	Full-time	Full-time
<b>Number of semesters</b>	18months	18months	2yrs	2yrs	2yrs	18months	24 months
<b>Total Credit Hours (without</b>	39.9	24	Na	24	32units	24	30

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

### 9. Summary of Similar Programs (Benchmarks) for Water and Environmental Engineering Program

Thesis)							
No. of Compulsory Courses		4	7		4-6	6	4
Credit Hours for Compulsory Courses	15	15	12	15	15	11	12
No. of Elective Courses	2	3	5	-	3	2	6
Credit Hours for Elective Courses	5	9	15	-	9	4	18
Complementary courses to join the program and their number	-	-	2	6-	-	-	6
Credit Hours for Thesis	30.5	12	Thesis	8	13	9	6
Total Credit Hours for courses & Thesis	70	36	na	32	45	33	36
The period for thesis completion	6-8months	1yr	1yr		1yrs	1 yrs	1 yr
The min. period to complete the program	18months	18months	2yrs	2yrs	2yrs	18months	2yrs
The max. period to complete the program	20mnths				3yrs	3 yrs	3yrs

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			





## Program Specification

### 10. Program Intended Learning Outcomes (PILOs)

#### A. Knowledge and Understanding

Upon successful completion of the Master of Science in Water and Environmental Engineering Program, graduates should be able to:

A1.	Demonstrate in-depth understanding of the theory and practice of modern Water and Environmental systems identification, design and operation.
A2.	Demonstrate understanding of methodology, research planning, and analysis techniques.
A3.	Explain in details the key considerations and challenges of sustainable development of modern Water and Environmental systems.

#### B. Intellectual Skills

Upon successful completion of the Master of Science in Water and Environmental Engineering Program, graduates should be able to:

B1.	Identify, formulate, and solve complex Water and Environmental Engineering problems by selecting and applying appropriate tools and techniques.
B2.	Critically review the scientific literature for effective justification and support of results and decisions.
B3.	Select appropriate techniques and tools for successful problem solving.
B4.	Adopt appropriate methodologies, techniques and tools for analysis and evaluation of Water and Environmental engineering systems.

#### C. Practical and Professional Skills

Upon successful completion of the Master of Science in Water and Environmental Engineering Program, graduates should be able to:

C1.	Apply modern tools for research, analysis, and design of modern systems.
C2.	Apply tools and techniques within the interdisciplinary nature to solve complex technical problems.
C3.	Employ design standards and safety codes as an integral part of Water and Environmental process.
C4.	Develop, conduct, defend and disseminate academic research or project in one of the Water and Environmental engineering areas.

#### D. Key Transferrable Skills

Upon successful completion of the Master of Science in Water and Environmental Engineering Program, graduates should be able to:

D1.	Prepare, present and defend a thesis and Project.
D2.	Incorporate professional with ethical responsibilities including contemporary issues and environmental awareness.
D3.	Conduct research independently and communicate to advance knowledge in related fields.

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

11. Teaching Strategy to Achieve Program Learning Outcomes		
ILOs	Teaching Strategy	Assessment Methods
A1	Lectures, Seminars, laboratory works, Self-study, independent study, Active learning, computer hands-on sessions.	Experimental and field work, laboratory report, Written Exam, Assignments
A2		
A3		
B1	Project supervision, laboratory works, Self-Learning, simulation exercises, independent study, Analysis and Problem Solving, Lectures, Brain storming Presentations, Presenting researches	Experimental and field work, laboratory report, Written Exam, Assignments.
B2		
B3		
C1	Project supervision, lectures, laboratory works, independent study, simulation exercises, Analysis and Problem Solving	Seminar report, written research proposal, thesis and publication.
C2		
C3		
D1	dissertation and presentation, independent study, Presenting reports, Brainstorming, Presenting researches, Publish research papers.	Written research proposal, thesis and publication, Written Exam, Assignments, Experimental and field work, laboratory report, survey, presentation, written report.
D2		
D3		

Teaching Strategy	Description of the Main Strategy Used		
<b>Lectures.</b>	These are interactive lectures weekly conducted according to course plan in a classroom and supported with variety of teaching formats including, lectures and multimedia presentations, use of whiteboard and solved examples, and class discussions, in which concepts, approaches, and case studies are presented, explored, and shown students what they need to know.		
<b>Independent study</b>	Independent study is an individualized learning experience that allows students to select a topic focus, define problems or questions, gather and analyze information, apply skills, and create a product to show what has been learned.		
<b>Self-Learning.</b>	Students are encouraged to undertake independent study to both supplement and consolidate what are being learned.		
<b>Active learning</b>			
<b>Computer hands-on sessions.</b>	Practical applications using a variety of software before the real design and implementation (after graduation). A variety of web-based searches students will be assigned to learn how they can search for solutions using the Web.		
<b>Simulation exercises</b>			
<b>Analysis and Problem</b>	The study of Water and Environmental Engineering involves applying		
Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

<b>Solving.</b>	knowledge and problem-based learning. This allows students to become more active in their learning as they work out wat information, they need to find out how to solve a particular problem. They can work out a problem collaboratively, practice research as well as testing different components to come up with a valid solution.
<b>Laboratory works.</b>	During laboratory sessions, students will be given experiments to work in groups where they can apply the theories and principles gained. This gives them the opportunity to have hands-on experience to design and conduct experiments in addition to analyzing, interpreting data obtained from experiments, and maximize their learning through actual simulation
<b>Presentations/ Presenting researches</b>	students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Presentation sessions provide an opportunity to address questions, queries, and problems.
<b>Project supervision</b>	The teacher needs to set advance work for students, and then have the students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Project sessions provide an opportunity to address questions, and problems.
<b>Brain storming</b>	Brainstorming is an effective technique for generating lists of ideas and creating interest and enthusiasm for new concepts or topics. Brainstorming provides teachers and students with an overview of what students know and/or think about a specific topic. Students can use brainstorming to organize their knowledge and ideas.
<b>Dissertation</b>	
<b>Publish research</b>	The thesis is converted into a paper where the supervisor (s) guide the student to prepare a paper for publication. The first author will be the student and supervisor (s) come after.
<b>Seminar</b>	The teacher needs to set advance work for a selected number of students, and then have the selected students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Seminar sessions provide an opportunity to address questions, queries, and problems.
<b>Research activities</b>	Research-led activities envisage activities in which students learn about current research in the discipline and are frequently an audience. The emphasis is put on the research content.

Assessment Strategy	Description of the main strategy used.		
Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

Assessment Strategy	Description of the main strategy used.
<b>Written Exam</b>	Mid-term test is conducted in the 8 <sup>th</sup> week and final exam is conducted at the end of each course. Both tests are closed or open book, notes and resources. At least two quizzes must be done through the course.
<b>Oral Discussion</b>	To know the knowledge of the students.
<b>Presentations</b>	For Final Results displaying, to enhance the level of students in different subjects.
<b>Quizzes</b>	The entire assessment of Quizzes activities during the teaching period of each course.
<b>Laboratory Reports</b>	To demonstrate the personal skills, practical expertise, communication skills, report writing skills, and team work expertise they are expected to be learned and gained through their education.
<b>Experimental and field work</b>	For evaluation, to demonstrate the personal skills, practical expertise, communication skills, report writing skills, and team work expertise they are expected to be learned and gained through their education.
<b>Survey</b>	NA
<b>Assignments</b>	The entire assessment of coursework activities during the teaching period of each course (which includes group and individual work, tests and presentations, etc.)
<b>Seminar</b>	The student presents the MSc proposal in a seminar. The students could also encourage to attend at least one on-line/ face to face seminar in the same field of the study
<b>Written report</b>	A report from the student is expected for the diploma project
<b>Written research proposal</b>	A research from the student is expected for the MSc research
<b>Thesis and publications</b>	Publication is preferred to be an outcome of the thesis

### 12. Intended Learning Outcomes Mapping:

See Annex 10

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

13. Program Structure			
Program Requirement	No. of Courses	Credit Hours	%
Complementary Courses	See List below.		
Faculty Requirement	1	3	8%
Compulsory Courses	3	9	25%
Elective Courses	6	18	50%
Thesis	-	6	17%
<b>Total</b>		<b>36</b>	<b>100%</b>

Complementary Courses (00 hrs)						
No	Course Code	Course Title	L	T	P	Cr. Hrs.
1	CE206	Fluid Mechanics	2		2	3
2	CE210	Hydraulics	2		2	3
3	CE306	Port Engineering	3			3
4	CE308	Sanitary Eng. 1	2		2	3
5	CE309	hydrology	3			3
6	CE312	Irrigation Eng.	3			3
7	CE402	Sanitary Eng. 2	2		2	3
8	CE404	Hydraulic structures	3			3
9	CE408	Solid waste management	2			2

Compulsory Courses (4 Courses, 12 CH)						
No	Course Code	Course Title	L	T	P	Cr. Hrs.
1	FR501	Research Methodology	3			3
2	CE566	Advanced Environmental Engineering	3			3
3	CE551	Advanced Hydrology	3			3
4	CE543	Advanced Hydraulics	2		2	3
<b>Total</b>						<b>12</b>

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:



Master of Science in Water and Environmental Engineering

## Program Specification

Elective Courses of Water Resources (4 Courses, 12 CH)						
No	Course Code		L	T	P	Cr. Hrs.
1	CE552	Desalination and Membrane Technology	3			3
2	CE553	Watershed Hydrology and modeling	3			3
3	CE554	Rainwater Harvesting	3			3
4	CE555	Groundwater Flow modeling	3			3
5	CE556	Irrigation systems	3			3

Elective Courses of Sanitation (4 Courses, 12 CH)						
No	Course Code		L	T	P	Cr. Hrs.
1	CE556	Wastewater Treatment	2		2	3
2	CE557	Drinking Water Treatment	2		2	3
3	CE558	Microbiology	2		2	3
4	CE559	Reuse of treated wastewater and sludge	3			3
5	CE560	Water quality control	3			3
6	CE561	WASH	3			3

Elective Courses of Environment (4 Courses, 12CH)						
No	Course Code		L	T	P	Cr. Hrs.
1	CE562	Environmental protection	3			3
2	CE563	Chemistry and Biology of Environment	2		2	3
3	CE564	Environmental and Social Impact Assessment	3			3
4	CE565	Climate change	3			3

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



## Program Specification

Elective Courses of Hydraulics (4 Courses, 12 CH)						
No	Course Code		L	T	P	Cr. Hrs.
1	CE567	Urban water supply	3			3
2	CE568	Design of Dams	3			3
3	CE569	Coastal Engineering	3			3
4	CE540	Irrigation structures	3			3
5	CE541	Urban Drainage and Sewerage network	3			3
6	CE542	Sediment Transport	3			3

Elective Courses of General (4 Courses, 12 CH)						
No	Course Code		L	T	P	Cr. Hrs.
1	BR528	Statistical Analysis	3			3
2	CE544	Computer applications	2		2	3
3	CE500	GIS	2		2	3
4	CE545	Advanced engineering mathematics	3			3
5	BR526	Diploma Project	2		2	3
	BR541	Advance Engineering project Management				

### Thesis

The student must prepare and discuss a thesis by (6) credit hours.

THESIS599 MS Thesis

### Thesis and Its Requirements (if any)

#### 1. Registration of the thesis:

(Requirements/conditions and procedures for registration of the thesis as well as controls, responsibilities and procedures of scientific guidance)

-Completion of all required Compulsory & Elective Courses with average grade more than or equal to 75% .

-Completion of all university requirements.

-Field of Research and precise research topic with short Description and suggested time plan.

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

### Thesis

- First Department Seminar.
- Decision letter (Supervisors) of acceptance of the research topic.
- Thesis work should be done in at least 2-semester.
- Thesis work should be done in at most 4-semester.
- Any further requirements and controls based on post-graduate deanship regulations.

### 2. Scientific Supervision:

(The regulations of the selection of the scientific supervisor and his/her responsibilities, as well as the procedures/mechanisms of the scientific supervision and follow-up)

- At most 2-supervisors are selected for the supervision of a thesis.
  - At least 1-Associate (or Full) Professor is appointed as supervisor either from the department or from another department outside the faculty.
  - Any Assistant Professor appointed as supervisor should have at least 4-year experience in the field of research and have published at least one paper.
- Candidates may apply for one-year extension (full-time) for completion of the thesis to the Postgraduate Program Administration at the Faculty of Engineering, which will be granted if the candidate provides a valid reason for extension.

The supervisor responsibilities are - :

- Help and assist the candidate/researcher in preparing the research plan.
- Guide the candidate to adhere to certain standards of academic integrity and research ethics, including combating plagiarism.
- Monthly, follow up and meeting with the researcher (at least one meeting per month)
- Guide the researcher at every step to be done during thesis work,
- Write follow-up (progress report) after each meeting
- Write a follow-up (evaluation report) every semester.
- The supervisor shall submit copies of these reports to the Postgraduate-Program coordinator, the Head of the Department and the Head of the Faculty Post-graduate.
- Write the final thesis acceptance report in order to prepare the final department seminar and then initiating the preparation for thesis presentation, defense and approve.

The candidate/student responsibilities are - :

- Student present his/her accomplishment at the end of every semester
- plan and actively pursue the research;
- identify and deal with any research-related problems.
- comply with administrative requirement.
- meet ethical guidelines.
- take responsibility for the final form of the thesis.
- A thesis or research portfolio is the outcome of independent research, or creative activity

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

### Thesis

conducted under supervision.

- The length of a 6 credit hours thesis or research portfolio will be appropriate to the discipline and must not exceed 30,000 words, including bibliography, footnotes or endnotes and essential appendices, unless specific permission has been granted by the Department.

### 3. Thesis Defense/Examination:

(The regulations for selection of the defense/examination committee and the requirements to proceed for thesis defense, the procedures for defense and approval of the thesis, and criteria for evaluation of the thesis)

- A thesis proceeds for defense following completion of:
- Preferable, one research paper is accepted for publication in the related field.
- Final acceptance letters provided by the supervisor(s) and the department final seminar committee (at least 3-department members)
- The examination committee should consist of - :
- One -Associate (or Full) Professor specialized in the field of research from an external university
- One -Associate (or Full) Professor from the department of Water and Environmental Engineering in addition to the supervisor of the thesis.
- A session for presentation, defense and approval of the thesis should be done based on the following- :
- At least two members of the examination committee accept their assignment and reply by acceptance letter and approve the thesis for defense within one month.
- The session of defense should be declared within two weeks after receiving of examination committee members approval letters.

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

### 14. System of Study

Type of program	Courses and Research
Study methods in the program:	Regular
The period to complete the program	Min. 2 Years (4 Terms) Max. 3 Years (8 Terms)
Total Credit Hours for courses & Research	36

### 15. Study Plan

FR stands for Faculty Requirements.  
 CE5XX stands for Civil Department Requirements.

First Semester								
No.	Course Code	Course Name	اسم المقرر	Credit Hours				Prerequisites
				Lec.	Pr.	Tut.	Total C.H.	
1	CE566	Advanced Environmental Eng.		3			3	
2	CE551	Advanced Hydrology		3			3	
3	CE543	Advanced Hydraulics		3			3	
4	CE5XX	Specific Electives-1		3			3	
5	XX5XX	General Electives-1		3			3	
<b>Total Credit Hours</b>							<b>15</b>	

Second Semester								
No.	Course Code	Course Name	اسم المقرر	Credit Hours				Prerequisites
				Lec.	Pr.	Tut.	Total C.H.	
1	FR501	Research Methodology		3			3	
2	XX5XX	General Elective -2		3			3	
3	CE5XX	Specific Electives-2		3			3	
4	CE5XX	Specific Electives-3		3			3	

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			





## Program Specification

Elective Courses – Environmental								
No.	Course Code	Environment	اسم المقرر	Credit Hours				Prerequisites
				Lec.	Pr.	Tut.	Total C.H.	
1	CE563	Environmental Protection		3			3	
2	CE564	Chemistry and Biology of Environment		3			3	
3	CE565	ESIA		3			3	
4	CE566	Climate change		3			3	

Elective Courses – Hydraulics								
No.	Course Code	Hydraulics	اسم المقرر	Credit Hours				Prerequisites
				Lec.	Pr.	Tut.	Total C.H.	
1	CE568	Urban water supply		3			3	
2	CE569	Design of Dams		3			3	
3	CE570	Coastal Engineering		3			3	
4	CE540	Irrigation structures		3			3	
5	CE541	Urban draining and sewerage network		3			3	
6	CE542	Sediment Transport		3			3	

Elective Courses – General Electives								
No.	Course Code	General	اسم المقرر	Credit Hours				Prerequisites
				Lec.	Pr.	Tut.	Total C.H.	
1	BR528	Advanced Mathematics		3			3	
2	CE544	Computer application in water and Environment		3			3	
3	CE500	GIS		3			3	

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



## Program Specification

4	CE545	Diploma Project		3			3	
5	BR526	Statistical Analysis		3			3	
6	BR541	Advance Engineering project Management		3			3	

Course Code	Course Name	Cr. Hrs.
THESIS599	Research	6

### 16. Admission Requirements:

1. Bachelor of Civil Engineering Certificate with not less than 65 % passing ratio, or equivalent.
2. Interview
3. TOEFL / IBT: 60
4. ICDL (Computer Skills):
5. Arabic Language:
6. Student number capacity of 20 students per year
7. Transfer Requirements, and Courses Equivalency
8. Annex -13: shows the Admission Requirements for the Program.

### 17. Graduation Requirements:

- Student attendance should not be less than 75%.
- Student will graduate after successfully passing the 30 credit hours courses and 6 credit hours Research.
- Student must achieve a minimum average score for all courses is 75% degree
- Minimum score for any student to pass any credit hours course is 65% degree.
- Grading System:
- |                                 |           |
|---------------------------------|-----------|
| From 90% to 100% of total marks | Excellent |
| From 80% to less than 90%       | Very Good |
| From 75% to less than 80%       | Good      |
| From 65% to less than 75%       | Pass      |
| Less than 65%                   | Poor/Fail |

### 18. Learning Resources, Facilities, and Equipment for Running the Program

#### Learning Resources.

Policies and Procedure for providing and quality assurance of learning resources textbooks, references and other resource materials, including electronic and web-based resources, Journal Database, etc.

- textbooks, reference
- university database which allows access to most of the international publishing houses

#### Facilities and Equipment

Policies and Procedure for providing and quality assurance of Facilities and Equipment (Library, laboratories (Structure, material Labs), medical facilities, classrooms, etc.).

:List of laboratories

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

Hydraulics and Hydrology Laboratory (upgrade)  
 Sanitary Laboratory (upgrade)  
 Computer Laboratory (upgrade)  
 CETU (  
 ITUCE  
 Resource Centre  
 Surveying Unit

19. Teaching staff:				
	Professor	Associate Professor	Assistant Professor	Technicians Assistants
<b>Required Number</b>				
<b>Available Number</b>	2	3	3	
<b>Note:</b>				

20. Program Management and Regulations
<p><b>1. Program Management</b>  <b>1.1 Program Structure</b>            (Including boards, councils, units, committees, etc.)            Civil Engineering Department Board            Postgraduate Studies Administration            Vice Dean for Postgraduate Studies            College of Engineering Board            Vice Presidency of the University for Postgraduate Studies</p>
<p><b>1.2 Stakeholders' Involvement</b>            Describe the representation and involvement of stakeholders in the program planning and development.            (Students, professional bodies, scientific societies, alumni, employers, etc.)</p> <p>The stakeholders were involved in designing the program, including universities, research centers, the public and private sectors, through their participation in a workshop as well as in responding to and submitting a questionnaire.</p>
<p><b>2. Program Regulations</b>            Provide a list of related program regulations, including their link to online version: admission, study and exams, recruitment, appeals and complaint regulations, etc.)</p> <p>Decision of the Presidency of the Council of Ministers No. 40 of 2008            Decision of the Presidency of the Council of Ministers No. 141 of 2008            Graduate Studies Guide to Sana'a University</p>

21. Evaluation of Program Quality Matrix:			
Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time

**Note:**

**Evaluation Areas/Aspects** (e.g., leadership, effectiveness of teaching & assessment, learning resources, partnerships, etc.)

**Evaluation Sources** (students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, and others (specify)

**Evaluation Methods** (e.g., Surveys, interviews, visits, etc.)

**Evaluation Time** (e.g., beginning of semesters, end of academic year, etc.)

### 22. List of Annexes

	Academic Standards Curriculum Criteria of Accreditation Board for Water and Environmental engineering program.
<b>Annex (1)</b>	Survey of names of Similar Accredited Programs at International Universities (Benchmarks) for Water and Environmental Engineering Programs.
<b>Annex (2)</b>	Survey of Intended Learning Outcomes for similar Accredited Water and Environmental engineering Programs at International Universities.
<b>Annex (3)</b>	Summary of similar Programs (Benchmarks) for Master of Science in Water and Environmental engineering Program.
<b>Annex (4)</b>	Survey of course names of Similar Programs.
<b>Annex (5)</b>	Survey/Mapping of Vision, Mission and Objectives of similar Accredited Programs at International Universities (Benchmarks) for Masters of Science in Water and Environmental engineering programs.
<b>Annex (6)</b>	Mapping of the mission and objectives of the program with the vision, mission and objectives of faculty, and the university.
<b>Annex (7)</b>	Main Themes/Sub-Themes with Relative weight for Program (if need)
<b>Annex (8)</b>	PILOs Distribution to General Themes for Program (if need)
<b>Annex (9)</b>	Matrix of mapping program P- ILOs with courses
<b>Annex (10)</b>	Mapping the benchmarks with PILO's (if need)
<b>Annex (11)</b>	Mapping Program's Goals with Intended Learning Outcomes
<b>Annex (12)</b>	

### 23. Attachment of Courses specification and Syllabi of the Program

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
Faculty of Engineering  
Department: Civil Engineering  
Title of the Program:  
Master of Science in Water and Environmental Engineering



## **Program Specification**

---

---

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
Faculty of Engineering  
Department: Civil Engineering  
Title of the Program:  
Master of Science in Water and Environmental Engineering  
**Program Specification**



ملحق (1) المعايير الأكاديمية للمحتوى لهيئة الاعتماد المقترحة لبرنامج ماجستير هندسة المياه والبيئة  
(Annex-1): Academic Standards Curriculum Criteria of Accreditation Board for Master of Science in Water and Environmental Engineering program

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

ملحق (2) مسح أسماء البرامج المعتمدة المماثلة لبرنامج ماجستير هندسة المياه والبيئة

Annex (2) Survey of names Similar Accredited Programs at International Universities (Benchmarks) for Master of Science in Water and Environmental Engineering Program

#	The Academic Program اسم البرنامج المماثل	The University الجامعة	The Faculty الكلية	The Department القسم	The Country الدولة	Program Accrediting Body جهة اعتماد البرنامج	Degree Award at Program Completion التي يمنحها الدرجة البرنامج للخريج	Year of accreditation سنة الحصول على الاعتماد	Type of program
The 1 <sup>st</sup> Program البرنامج الاول	- Urban Water and Sanitation: Sanitary Engineering-Delftbased; <u>Joint programme with Univalle, Colombia</u> Water Supply Engineering Delftbased Urban Water Engineering and Management	IHE Delft	IHE Delft	1-Urban Water and Sanitation	The Netherlands	This Program is accredited by the Accreditation Organization of the Netherlands and Flanders (NVAO)	MSc	Updated 2013	18 months Courses and thesis
The 2 <sup>nd</sup> Program البرنامج	MSc In Water And Environmental Engineering	KHALIFA UNIVERSITY	College of Engineering	College of Engineering	EMIRATE	All academic programs at Khalifa	MSc	Commission for Academic Accreditation (CAA) of The	18months, 2yrs, 3yrs courses and thesis

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
------------------------	--	---	--

Rector of Sana'a University  
 Prof. Dr. Al-Qassim Mohammed Abbas

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

#	The Academic Program اسم البرنامج المماثل	The University الجامعة	The Faculty الكلية	The Department القسم	The Country الدولة	Program Accrediting Body جهة اعتماد البرنامج	Degree Award at Program Completion التي يمنحها الدرجة البرنامج للخريج	Year of accreditation سنة الحصول على الاعتماد	Type of program
الثاني						<u>University are accredited with the Commission for Academic Accreditation of the UAE Ministry of Education and Accreditation Board for Engineering and Technology, Inc. (ABET) accreditation for the</u>		UAE and the QAA	
Head of the Department		Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi		Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti		Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad			
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas									

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

#	The Academic Program اسم البرنامج المماثل	The University الجامعة	The Faculty الكلية	The Department القسم	The Country الدولة	Program Accrediting Body جهة اعتماد البرنامج	Degree Award at Program Completion التي يمنحها الدرجة البرنامج للخريج	Year of accreditation سنة الحصول على الاعتماد	Type of program
						<p><u>new programs is underway, with 86% of undergraduate programs having received or are eligible for ABET accreditation. All academic programs at KU are accredited with the CAA of the UAE Ministry of Education</u></p>			
Head of the Department		Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi		Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti		Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad			
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas									

University of Sana'a  
Faculty of Engineering  
Department: Civil Engineering  
Title of the Program:  
Master of Science in Water and Environmental Engineering



## Program Specification

#	The Academic Program اسم البرنامج المماثل	The University الجامعة	The Faculty الكلية	The Department القسم	The Country الدولة	Program Accrediting Body جهة اعتماد البرنامج	Degree Award at Program Completion التي يمنحها الدرجة البرنامج للخريج	Year of accreditation سنة الحصول على الاعتماد	Type of program
						for the new programs is underway.			
The 3 <sup>rd</sup> Program البرنامج الثالث	ماجستير في الهندسة المائيه ماجستير في الهندسة الصحية البيئية	جامعة دمشق	كلية الهندسة المدنية	قسم الهندسة المائيه قسم الهندسة البيئية	سوريا	لا يوجد أي معلومات	ماجستير	<a href="http://damascu.suniversity.edu.sy/civil/?lang=1&amp;set=3&amp;id=418">http://damascu.suniversity.edu.sy/civil/?lang=1&amp;set=3&amp;id=418</a>	سنتين كورسات وبحث
The 4 <sup>th</sup> Program البرنامج الرابع	هندسة الري والهيدروليكا الهندسة الصحية	جامعة الإسكندرية	كلية الهندسة	قسم الهندسة المدنية	مصر	تم إنشاء وحدة ضمان الجودة بكلية الهندسة – جامعة الإسكندرية وتشكيل المكتب التنفيذي للوحدة بقرار مجلس الكلية بتاريخ 2005/8/9 وتتبع عميد	ماجستير	<a href="https://eng.al-exu.edu.eg/index.php/departments/civil">https://eng.al-exu.edu.eg/index.php/departments/civil</a>	سنتين كورسات وبحث

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification


#	The Academic Program اسم البرنامج المماثل	The University الجامعة	The Faculty الكلية	The Department القسم	The Country الدولة	Program Accrediting Body جهة اعتماد البرنامج	Degree Award at Program Completion التي يمنحها الدرجة البرنامج للخريج	Year of accreditation سنة الحصول على الاعتماد	Type of program
						الكلية ، مقر الوحدة بالدور الرابع بمبنى الهندسة الكهربائية بالكلية.			
<b>The 5<sup>th</sup> Program</b> البرنامج الخامس	MSc. In Environmental Engineering specialized in Hydrology and water resources:	STANFORD UNIVERSITY	Faculty of Engineering	Environmental Eng.	USA	Accreditation Board for Engineering and Technology (ABET)  Environmental Engineering	MSc	<a href="https://cee.stanford.edu/academics-admission/graduate/phd-and-masters-degree-programs/environmental-engineering">https://cee.stanford.edu/academics-admission/graduate/phd-and-masters-degree-programs/environmental-engineering</a>	
Head of the Department		Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi		Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti		Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad			
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas									



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

#	The Academic Program اسم البرنامج المماثل	The University الجامعة	The Faculty الكلية	The Department القسم	The Country الدولة	Program Accrediting Body جهة اعتماد البرنامج	Degree Award at Program Completion التي يمنحها الدرجة البرنامج للخريج	Year of accreditation سنة الحصول على الاعتماد	Type of program
						degree was ABET accredited			
The 6 <sup>th</sup> Program البرنامج السادس	درجة الماجستير في الهندسة المدنية- مياه وبيئة	JORDAN UNIVERISY	كلية الهندسه	قسم الهندسه المدنية- مياه وبيئة	الأردن	حصلت أقسام الهندسة (الكيميائية والكهربائية والميكانيكية) على شهادة الاعتماد العالمية من مجلس الاعتماد للهندسة والتكنولوجيا الأمريكي (ABET) في العام 2022. ووفقا للاعتماد العالمي (ABET) تعام	MSc	<a href="http://graduat-edstudies.ju.edu.jo/ar/arabic/Lists/FacultyAbstract/School_FacultyAbstract.aspx">http://graduat-edstudies.ju.edu.jo/ar/arabic/Lists/FacultyAbstract/School_FacultyAbstract.aspx</a>	

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

#	The Academic Program اسم البرنامج المماثل	The University الجامعة	The Faculty الكلية	The Department القسم	The Country الدولة	Program Accrediting Body جهة اعتماد البرنامج	Degree Award at Program Completion التي يمنحها الدرجة البرنامج للخريج	Year of accreditation سنة الحصول على الاعتماد	Type of program
						ل شهادات خريجي هذه الأقسام كأي شهادة في جامعة أمريكية معتمدة، لتكون "الأردنية" من الجامعات القليلة التي تحصل على هذا الاعتماد خارج الولايات المتحدة الأمريكية.			

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

ملحق (3) مسح مخرجات التعلم في البرامج المماثلة لبرنامج ماجستير هندسة المياه والبيئة

Annex-3, Survey of Intended Learning Outcomes for Similar Accredited for Master of Science in Water and Environmental Engineering Program at International Universities

Program Intended Outcomes	Suggested PILOs for the Current Program: Water and Environmental Engineering Program at Sana'a University	1st Program	2nd Program	3rd Program	4th Program	5th Program	6th Program
A. Knowledge and Understanding	Upon successful completion of a Master of Science in Water and Environmental Engineering Program, graduates should be able to:						
	A1. Demonstrate in-depth understanding of the theory and practice of modern Water and Environmental systems identification, design and operation.	√-(1)	√-(1)	√-(1)		√-(1)	
	A2. Demonstrate understanding of methodology, research planning, and analysis techniques.						
	A3. Explain in details the key considerations and challenges of sustainable development of modern Water and Environmental						

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

Program Intended Outcomes	Suggested PILOs for the Current Program: Water and Environmental Engineering Program at Sana'a University		1st Program	2nd Program	3rd Program	4th Program	5th Program	6th Program
		systems.						
	A4.							
<b>B. Cognitive/ Intellectual Skills</b>	<b>Upon successful completion of a Master of Science in Water and Environmental Engineering program, graduates should be able to:</b>							
	B1.	Identify, formulate, and solve complex Water and Environmental Engineering problems by selecting and applying appropriate tools and techniques.						
	B2.	Critically review the scientific literature for effective justification and support of results and decisions.						

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

Program Intended Outcomes	Suggested PILOs for the Current Program: Water and Environmental Engineering Program at Sana'a University		1st Program	2nd Program	3rd Program	4th Program	5th Program	6th Program
	B3.	Select appropriate techniques and tools for successful problem solving.						
	B4.	Adopt appropriate methodologies, techniques and tools for analysis and evaluation of Water and Environmental engineering systems.						
C. Practical and Professional Skills	<b>Upon successful completion of a Master of Science in Water and Environmental Engineering program, graduates should be able to:</b>							
	C1.	Apply modern tools for research, analysis, and design of modern systems.						
	C2.	Apply tools and techniques within the interdisciplinary nature to solve complex						

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

Program Intended Outcomes	Suggested PILOs for the Current Program: Water and Environmental Engineering Program at Sana'a University		1st Program	2nd Program	3rd Program	4th Program	5th Program	6th Program
		technical problems.						
	C3.	Employ design standards and safety codes as an integral part of Water and Environmental process.						
	C4.	Develop, conduct, defend and disseminate academic research or project in one of the Water and Environmental engineering areas.						
D. General and Transferable Skills	Upon successful completion of a Master of Science in Water and Environmental Engineering program, graduates should be able to:							
	D1.	Prepare, present and defend a thesis.						

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

Program Intended Outcomes	Suggested PILOs for the Current Program: Water and Environmental Engineering Program at Sana'a University		1st Program	2nd Program	3rd Program	4th Program	5th Program	6th Program
	D2.	Incorporate professional with ethical responsibilities including contemporary issues and environmental awareness.						
	D3.	Conduct research independently and communicate to advance knowledge in related fields.						
	D4.							
	D5.							

### Intended Outcomes for Similar Programs

**Program 1:** -----

1) A1. -----

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

The Academic Program اسم البرنامج المماثل	ILOs
<p><b>Urban Water and Sanitation:</b></p> <p><b>Sanitary Engineering- Delft based; Joint program with Univalve, Colombia</b></p> <p><b>Water Supply Engineering Delft based</b></p> <p><b>Urban Water Engineering and Management</b></p>	<p style="background-color: #00aaff; color: white; text-align: center; padding: 5px;">-</p> <p>Intended learning outcomes</p> <p>Given its academic domain, the overall aim of the WMG Master program is to impart students with the knowledge, insights and skills that are required to research, develop, implement and critically evaluate water management approaches and governance processes in order to foster equitable and sustainable uses and distributions of water. In line with these intended learning outcomes, final qualifications have been formulated at program level that specify the knowledge and skills that successful graduates of the WMG Master program should have acquired (Annex 2). These final qualifications include the newly defined final qualifications at Institute level that are applicable for all four 18-month Master programmers offered by IHE. Based on these final qualifications, additional end qualifications have been formulated for the joint specialization on Water Cooperation and Diplomacy (Annex 3). In addition, more general descriptions and learning objectives have been formulated to delineate the thematic profiles that students may opt for as part of their tailor-made track (Annex 4; for more details, see Chapter 3).</p>

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

<p><b>MSc In Water And Environmental Engineering Khelifa</b></p>	<p>ASSESSMENT OF STUDENT LEARNING</p> <p>Achievement of intended learning outcomes shall be evaluated through a variety of assessment instruments in a process of frequent evaluation that includes regular and timely feedback to students regarding their performance (refer to KU Academic Policy ACA 3300 Assessment of Student Learning). For policies and processes concerning the College of Medicine and Health Sciences, please refer to the CMHS Medical Student Handbook. Final grades are determined by the student's performance in a combination of the following:</p> <ul style="list-style-type: none"> <li>• Assigned work, term papers, projects, presentations.</li> <li>• Progress tests.</li> <li>• Laboratory tests and/or laboratory work.</li> <li>• Semester and/or final examinations.</li> <li>• Level of written expression</li> </ul> <p>STUDENT LEARNING OUTCOMES</p> <p>Students graduating with the MSc in Water and Environmental Engineering will be able to:</p> <ol style="list-style-type: none"> <li>1. Successfully apply advanced concepts of fundamental sciences and engineering to identify, formulate, and</li> </ol>
--	---

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

	<p>solve complex water and environmental engineering problems, and understand the impact of such solutions on sustainable development.</p> <ol style="list-style-type: none"> <li>2. Successfully apply advanced concepts of water and environmental engineering and fundamental sciences to design, analyze, and develop technologies, processes or systems to meet desired needs of society, both, professionally and ethically.</li> <li>3. Use an advanced and rigorous approach to the design and execution of experiments and to the analysis and interpretation of experimental data.</li> <li>4. Be knowledgeable of contemporary issues and research challenges/opportunities related to water and environmental engineering, and engage in lifelong learning to keep abreast of such issues.</li> <li>5. Use advanced techniques, skills, and modern scientific and engineering tools for problems related to professional practice in the field of water and environmental engineering.</li> <li>6. Communicate effectively and professionally in written and oral form, both, individually and as a member of a multidisciplinary team.</li> </ol>
<p>ماجستير في الهندسة المائية          ماجستير في الهندسة الصحية          البيئية          دمشق</p>	<p style="text-align: center;"><u>ربط مخرجات التعليم العالي بعالم الأعمال موضوع ورشة عمل بجامعة دمشق</u></p> <p>بدأت في السابع والعشرين من شهر تشرين الأول بقاعة رضا سعيد للمؤتمرات بجامعة دمشق ورشة العمل " سياسة ربط مخرجات التعليم العالي بعالم</p>

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
Faculty of Engineering  
Department: Civil Engineering  
Title of the Program:  
Master of Science in Water and Environmental Engineering



## Program Specification

الأعمال" التي تقيّمها وزارة التعليم العالي بالتعاون مع برنامج تطوير التعليم العالي الممول من الاتحاد الأوروبي بهدف اطلاع الجامعات على إستراتيجية الربط بين التعليم العالي وعالم الأعمال وتقديم لمحة عن الممارسات المثلى للتشبيك بين الجامعات وعالم الأعمال وتقديم الإطار العام لسياسة الربط بهدف مساعدة الجامعات على وضع خططها التنفيذية وتحديد فرق العمل المشاركة في التشبيك مع عالم الأعمال.

وأشار الدكتور ركان رزوق نائب رئيس جامعة دمشق لشؤون البحث العلمي إلى النشاطات التي تقوم بها الجامعة بهدف موائمة مخرجاتها التعليمية مع متطلبات سوق العمل.

واستعرض الدكتور واثق رسول آغا أمين مجلس التعليم العالي عضو اللجنة المكلفة بمتابعة هذا المشروع خلال الورشة أهم الأسباب التي دعت للتركيز على ربط التعليم العالي بسوق العمل ومنها الارتباط العضوي بين جودة التعليم العالي وموائمته لمتطلبات سوق العمل والتنمية والطبيعة المتغيرة لمتطلبات سوق العمل والتحول نحو اقتصاد السوق الاجتماعي والخطط الخمسية للدولة وتحقيق التنافسية بما يتعلق بتنافسية الاقتصاد السوري. لافتاً إلى وجود تحديات منها ما يتعلق بالطلاب كالمطلب المتزايد على التعليم العالي وضرورة تأمين طرق التعلم الجيدة والانتقال إلى تطبيق الأساليب التربوية الحديثة في التدريس وارتباط اختيار الطالب لمهنته واختصاصه بالقيم الاجتماعية وبتنتائج امتحانات التعليم الثانوي المفاضلة ولهذا فهناك عدد كبير من الطلاب يساقون لبعض الأقسام بسبب هذه العوامل.

وبما يتعلق بالجامعات أشار إلى ضعف الثقة بين أرباب العمل والجامعات وعدم انخراط أصحاب العمل في البنى الإدارية ذات العلاقة على مستوى الجامعات والكليات بالإضافة إلى ضعف التركيز على المهارات العملية في المقررات الجامعية وضعف الإرشاد المهني لدى الطلاب وبما يتعلق بقطاع العمل أشار إلى وجود تغيير سريع في طبيعة في سوق العمل في سورية الانفتاح على الاستثمارات الخارجية ووجود مهارات عالية قابلة للتوظيف وندرة الشركات التي تحتوي على قسم للموارد البشرية.

ولفت رسول آغا إلى الجهود التي تبذلها وزارة التعليم العالي من أجل سد الفجوة بين المخرجات التعليمية وقطاع سوق العمل من خلال مقارنة الجهات المسؤولة عن القطاعات الإنتاجية وعالم الأعمال بهدف فتح قنوات الاتصال مباشرة بينها وبين الشركات. وتقديم الدعم والإرشاد لإنشاء حاضنات ضمن الجامعات وفي المناطق الصناعية وإطلاق الخطة الوطنية لتطوير برامج التعليم العالي والتوسع في إحداث اختصاصات تلبي احتياجات سوق العمل وتشكيل لجنة وطنية لربط سوق العمل بالتنسيق مع البرنامج الأوروبي ورسم السياسة الوطنية للربط مع سوق العمل بالتعاون مع البرنامج الأوروبي.

وقدم جوني مكارثي خبير في البرنامج الأوروبي عرضاً عن الممارسات الدولية المثلى للربط مع عالم الأعمال أشار فيها إلى أهمية تدريب وتأهيل الطلاب وتنمية مهاراتهم ليكون قادرين على الولوج في سوق العمل مستعرضاً بعض الأفكار الكفيلة بتطوير سوق العمل لمواجهة التحديات التي يشهدها العالم. وأشارت سابين روث خبيرة العلاقة بسوق العمل إلى التجربة الناجحة التي جرت في حلب ودمشق من خلال دمج مجموعة من الطلاب في سوق العمل في بعض الشركات والمؤسسات في القطاعين العام والخاص بهدف تعريفهم بالعمل وكيفية التعامل مع أرباب العمل وتحسين مهاراتهم.

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
Faculty of Engineering  
Department: Civil Engineering  
Title of the Program:  
Master of Science in Water and Environmental Engineering



## Program Specification

<p>هندسة الري والهيدروليكا الهندسة الصحية الاسكندرية</p>	<p>سمات الحاصل على الماجستير:</p> <p>1- إجادة تطبيق أساسيات ومنهجيات البحث العلمي واستخدام أدواته المختلفة . تطبيق المنهج التحليلي والتطبيقي واستخدامه في مجال التخصص . تطبيق المعارف المتخصصة ودمجها مع المعارف ذات العلاقة في الدراسات البحثية . إظهار الوعي بالمشاكل الجارية والرؤى الحديثة في مجال التخصص .</p> <p>تحديد المشكلات البحثية وإيجاد حلول لها . إتقان نطاق مناسب من المهارات المهنية المتخصصة، واستخدام الوسائل التكنولوجية المناسبة بما يخدم الدراسات البحثية . التواصل بفاعلية والقدرة على قيادة فريق العمل لظروف المشكلات وضع مقترحات طبقاً للاخذ في الاعتبار المواد المتاحة بما يؤدي إلى أعلى استفادة منها عند التطبيق . إظهار الوعي بدوره في تنمية المجتمع والحفاظ على البيئة . التصرف بما يعكس التزام بالنزاهة والمصداقية والالتزام بقواعد البحث العلمي . وقادراً على التعليم المستمر تنمية ذاته أكاديمياً وبحثياً</p> <p>المعايير القياسية العامة:</p> <p>2- المعرفة والفهم:</p> <p>A بانتهاء دراسة برامج الماجستير يجب أن يكون الحاصل على الماجستير على فهم ودراية بكل من:</p> <p>النظريات وأساسيات المتعلقة بمجال التعلم وكذا في المجالات ذات العلاقة</p> <p>a.1 التأثير المتبادل بين الدراسات البحثية وانعكاسها على البيئة .</p> <p>a.2 التطورات العلمية في مجال التخصص .</p> <p>a.3 المبادئ الأخلاقية والقانونية للبحث العلمي في مجال التخصص</p> <p>a.4 مبادئ وأساسيات الجودة في تطبيقاته البحثية في مجال التخصص</p> <p>a.5 أساسيات وأخلاقيات البحث العلمي</p> <p>a.6 . المهارات الذهنية</p> <p>B بانتهاء دراسة برنامج الماجستير يجب أن يكون الحاصل على الماجستير قادراً على:</p> <p>تحليل وتقييم المعلومات في مجال التخصص والقياس عليها لحل المشاكل .</p> <p>b.1 اقتراح حلول للمشاكل المتخصصة مع عدم توافر بعض المعطيات .b.2 . الربط بين المعارف المختلفة لحل المشاكل المهنية</p> <p>b.3 . إجراء دراسة بحثية أو كتابة دراسة علمية منهجية حول مشكلة بحثية</p> <p>b.4 . تقييم المخاطر في الممارسات المهنية في مجال التخصص .</p> <p>b.5 . التخطيط لتطوير الأداء في مجال التخصص .</p>
--	---

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

	<p>b.7. للظروف المحيطة تقديم مقترحات لاتخاذ القرارات المهنية طبقا          b.6. المهارات المهنية          C بانتهاء دراسة برنامج الماجستير يجب أن يكون الحاصل على الماجستير قادرا على:          إتقان المهارات البحثية الأساسية والحديثة في مجال التخصص.          c.1. كتابة وتقييم التقارير والابحاث          c.2. تقييم الطرق والأدوات المستخدمة في حل المشاكل والدراسات البحثية          c.3. المهارات العامة المنقولة          D بانتهاء دراسة برنامج الماجستير يجب أن يكون الحاصل على الماجستير قادرا على:          d.1. التواصل الفعال بأنواعه المختلفة          d.2 استخدام تكنولوجيا المعلومات بما يخدم تطوير الأساليب البحثية          d.3 استخدام المصادر المختلفة للحصول على المعلومات والمعارف.          d.4. وضع قواعد ومؤشرات تقييم الأداء البحثي.          d.5. لظروف الدراسة وقيادة فريق طبقا ، العمل في فريق          d.6 إدارة الوقت بكفاءة .          d.7 التعليم الذاتي والمستمر          d.8.التقييم الذاتي وتحديد احتياجاته التعليمية الشخصية</p>
<p><b>MSc. In Environmental Engineering specialized in Hydrology and water resources: -standard- USA</b></p>	<p><b><u>Learning Outcomes (Graduate)</u></b>          The purpose of the master's program is to equip students with the knowledge and skills necessary for a successful professional career or for the pursuit of doctoral studies. Students are prepared through course work that is organized into three broad areas including the built environment, atmosphere and energy, and environmental engineering. Graduate students must master the analytical, quantitative, and interpretive skills necessary for successful leadership in their chosen field.</p>

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

The Ph.D. is conferred upon candidates who have demonstrated substantial original scholarship and the ability to conduct independent research. The Ph.D. program prepares students to make original contributions to the theory and practice of Civil and Environmental Engineering and related fields.

### Graduate Programs in Civil and Environmental Engineering

The Department of Civil and Environmental Engineering (CEE) offers graduate degrees structured in three areas of study.

- The Atmosphere/Energy Program offers degrees with the designation of Atmosphere/Energy.
- The Sustainable Built Environment Program offers degrees with two designations:
  - Structural Engineering and Geomechanics
  - Sustainable Design and Construction
- The Environmental Engineering Program offers degrees with the designation of Environmental Engineering

For detailed information on these programs and degree designations, see the "Programs of Graduate Study in Civil and Environmental Engineering" section of this bulletin.

درجة الماجستير في الهندسة  
 المدنية- مياه وبيئة  
 الأردن

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

ملحق (4) مسح ملخص البرامج المماثلة لبرنامج ماجستير هندسة المياه والبيئة

Annex-4, Summary of Similar Programs (Benchmarks) for Master of Science in Water and Environmental Engineering Program

Summary of Similar Programs (Benchmarks) for Water and Environmental Engineering Program							
The Program Title	The Similar Programs (Benchmarks)						Current program
	The 1st Program	The 2nd Program	The 3rd Program	The 4th Program	The 5th Program	The 6th Program	
Urban Water and Sanitation: - Sanitary Engineering Delft based; Joint program with Univalve, Colombia  Water Supply Engineering Delft based Urban Water Engineering and Management	MSc In Water and Environmental Engineering	ماجستير في الهندسة المائية ماجستير في الهندسة الصحية البيئية	هندسة الري والهيدروليكا الهندسة الصحية	MSc. In Environmental Engineering specialized in Hydrology and water resources:	درجة الماجستير في الهندسة المدنية- مياه وبيئة	Water and Environmental Engineering	
<b>The Faculty</b>	IHE Delft	College of Engineering	كلية الهندسة المدنية	كلية الهندسة	School of Eng.- civil and env.	كلية الهندسة	Engineering
Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad				
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas							



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

### Summary of Similar Programs (Benchmarks) for Water and Environmental Engineering Program

					Eng.		
<b>The University</b>	IHE-Delft	Khalifa	دمشق	Alexandria	Stanford	Jordanian	Sana'a University
<b>The Country</b>	The Netherlands	Emirate	Syria	Egypt	USA	Jordan	Yemen
<b>Type of program</b>	Courses and Research	Courses and Research	Courses and Research	Courses and Research	Courses and Research	Courses and Research	Courses and Research
<b>Study methods in the program:</b>	Regular	Regular	Regular	Regular	Regular	Regular	Regular
<b>Number of semesters</b>	4	4	4	4	4	4	4
<b>Total Credit Hours (without Thesis)</b>	39.9	24	Na	24	32units	24	30
<b>Credit Hours for compulsory courses</b>		12	na		14	18	6
<b>Credit Hours for Electives courses</b>		12			18units	6	12-15

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

### Summary of Similar Programs (Benchmarks) for Water and Environmental Engineering Program

<b>No. of Courses for Electives courses</b>		4			6-8	2	4-5
<b>No. of Courses for compulsory courses</b>		4	7		4-6	6	6
<b>Complementary courses to join the program and their number</b>					6	NA	To be discussed
<b>Credit Hours for Thesis</b>	30.5	12	Thesis	8	13	9	6
<b>Total Credit Hours for courses &amp; Thesis</b>	70	36		32	45	33	36
<b>The period for thesis completion</b>	6-8months	1yr	1yr		1yr	1 yr.	1 yr.
<b>The min. period to complete the</b>	18months	18months	2	2	2yrs	18months	2yrs

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

**Summary of Similar Programs (Benchmarks) for Water and Environmental Engineering Program**

program							
The max. period to complete the program	20mnths				3yrs	3 yrs.	3yrs

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

ملحق (5) مسح أسماء المقررات الدراسية في البرامج المماثلة لبرنامج ماجستير هندسة المياه والبيئة  
 Annex-5, Survey of Course Names of Similar Program

University	IHE-Delft	Khalifa	دمشق	Alexandria	Stanford	Jordanian	Sana'a University
<b>Faculty</b>	IHE Delft	College of Engineering	كلية الهندسة المدنية	كلية الهندسة	School of Eng.- civil and env. Eng.	كلية الهندسة	Engineering
<b>Program</b>	Urban Water and Sanitation: Sanitary Engineering- Delft based; Joint program with Univalve, Colombia Water Supply Engineering Delft based Urban Water Engineering and	MSc In Water and Environmental Engineering	ماجستير في الهندسة المائية ماجستير في الهندسة الصحية البيئية	هندسة الري والهيدروليكا الهندسة الصحية	MSc. In Environmental Engineering specialized in Hydrology and water resources:	درجة الماجستير في الهندسة المدنية- مياه وبيئة	Water and Environmental Engineering

Head of the Department

Quality Assurance Unit  
 Assoc. Prof. Dr. Mohammad Algorafi

Dean of the Faculty  
 Prof. Dr. Mohammed AL-Bukhaiti

Academic Development Center & Quality Assurance  
 Assoc. Prof. Dr. Huda Al-Emad

Rector of Sana'a University  
 Prof. Dr. Al-Qassim Mohammed Abbas

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

Country	The Netherlands	Emirate	Syria	Egypt	USA	Jordan	Yemen
<b>No. of Courses</b>		8	7	8	10	15	8
<b>Total Cr. Hrs.</b>	70	24	Na	24	45	54	30
<b>Total Years</b>	1.5	2	2	2	2	2	2
No	Course Name	Course Name	Course Name	Course Name	Course Name	Course Name	Course Name
	Modelling Wastewater Treatment Processes and Plants Industrial Effluents Treatment and Residuals Management Experimental	- Chemicals in the Environment : Fate and Transport - Industrial Ecology - Hydrologic Analysis	- الإدارة البيئية - المتكاملة	طريقة العناصر المحدودة في المنشآت المائية هندسة الأنهار وحركة الرواسب هيدروليكا الآبار هيدرولوجيا المياه	Environmental and process engineering: Movement and fate of organic contaminants in waters	الطرق العددية هندسة المائيات وحدة العمليات في المياه والمياه العادمة انتقال المواد	المواد المتبقية التي لم تستخدم في توصيف مواد هندسة المياه والبيئة

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

	Methods in Wastewater Treatment	- Data Analysis for Environmental Modeling		الجوفية اتزان جسور قنوات الري والصرف نظم خفض الأرضية لمتنشآت الري والصرف استخدام نظم الأنابيب في شبكات الري تصميم وإنشاء التبتطين لقنوات الري الإدارة المتكاملة والتنمية المستدامة لمصدر مياه الري دراسة هيدرولوجية وهيدروليكية نهر النيل الطرق المائي في	Water resources and Hazards  Fluid mechanics Hydrodynamics  Rivers, streams and canals  -Shaping the future of the Bay Area  Race in Science  The business of water	الرسوبية المحاكاة في هندسة البيئة  الموضوعات الخاصة في الهندسة المدنية	
--	---------------------------------	--	--	--	--	---	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

				الأنايب وطرق الحماية منشآت المساقط المائية في القنوات تحليل نظم مصادر المياه تبديد الطاقة خلف المنشآت الهيدروليكية مصبات الترع والمصارف النحر خلف المنشآت المائية وطرق تبديد الطاقة محطات الطلمبات منشآت التحكم في المياه	California coast: science/policy/law  Introduction of fuzzy set comparative analysis  California coast: science policy/law  Process design for Envir. Biotechnology  Environmental and geophysical		
Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad				
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas							

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

				تخطيط وانشاء مشاريع الري والصرف القياسات الهيدروليكية والهيدرولوجية والبيئية قواعد بيانات النظم الهيدروليكية هيدروليكا المصببات هيدروليكا احواض الاستقبال للأنهار مواضيع حديثة في هندسة مصادر المياه القياسات والنماذج الهيدروليكية هيدروليكا محطات	fluid mechanics: Physics of wind Wind engineering for sustainable cities Hydrodynam cs Transport and mixing in surface water flows Coastal ocean modeling		
--	--	--	--	---	---	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering  
**Program Specification**



				الرفع النحر الموضوعي خلف المنشآت مقرر خاص التحليل المتقدم لنظم الري والصرف هيدرولوجيا الأمواج تصميم الآبار وصيانتها التدفق غير الثابت في القنوات المكشوفة ميكانيكا الموائع اساسيات التراكيبات الصحية اقتصاديات مشاريع المياه والمخلفات	Physics oceanography  Rivers, streams, and canals  Ocean waves  Atoms., ocean and climate dynamics: ocean circulations  Weather and storms  Topics in fundamental		
--	--	--	--	---	---	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

				السائلة التركيبات الصحية	turbulence Geophysical fluid dynamics Stochastic hydrology Imaging with incomplete information Water, models, and decision making Environment al data, statistics and modeling:		
--	--	--	--	-----------------------------	---	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



**Program Specification**

						Intro. To fuzzy set comparative analysis  Imaging with incomplete information  Introduction to numerical methods for engineering  Stochastic methods in engineering  Machine learning  Deep learning		
--	--	--	--	--	--	--	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

						Fundamental s of data science: prediction, inference, causality  Providing safe water for developing world  Intro. Human Exposure Analysis  Physical hydrogeology  Contaminant		
--	--	--	--	--	--	--	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

						hydrogeology and reactive transport  Remote sensing of hydrology		
1				- حماية البيئة	المخلفات الصلبة الهندسة البيئية هندسة البيئة المائية إدارة المخلفات الصلبة	Environmental Engineering (9 units): - environmental engineering seminar Air pollution & Global Warming: History,	تلوث الهواء إدارة المخلفات الصلبة	1-Advanced Environmental Eng.

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

					science, solns Air quality management Air pollution fundamentals		
2		-		الهندسية الهيدرولوجيا	Hydrology and water resources Hydrology and water resources:	هيدرولوجيا المياه السطحية	2-Advanced Hydrology
3			الهيدروليك المتقدم	هيدروليكا متقدمة الهيدروليكا الحسابية هيدروليكا تطبيقية			3-Advanced Hydraulics
4							
5	4-		طرائق البحث العلمي				4-Research Methodology

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



### Program Specification

6					Physical and chemical treatment processes' Coastal contaminants Microbial bioenergy systems Pathogens and disinfection Environ. Health Microbiology Human Health and environment Pathogen and disinfection' Coastal contaminants		5-WASH
7				التحليل الإحصائي في هندسة مصادر المياه (متقدم)			6-Statistical Analysis

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

				التحليل الإحصائي في هندسة مصادر المياه			
8			الرياضيات المتقدمة				gEl-1-Advanced mathematics
9			النمذجة الرياضية للموارد المائية				gEl-2-Computer application in Water and Environment
10							Gel-3-GIS
11	Urban Flood Management and Disaster			هيدرولوجيا السيول ووسائل الحماية منها	Water resources and Hazards Engineering risk analysis		Gel-4-Flood disaster risk management
12	Asset Management Drinking and Waste Water Treatment Decentralized Water Supply and Sanitation Unit Operations in Water Treatment Disinfection, Adsorption and	- Selected Topics in Water and Environment al Engineering		اقتصاديات مشاريع المياه والصرف الصحي			Gel-5-Case study project (Selected Topics in Water and Environmental Engineering)

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

	Natural Processes for Water Treatment Groundwater Resources and Treatment Water Treatment Processes and Plant Design						
13	Desalination and Membrane Technology	Desalination	-				Wr-1-Desalination and Membrane Technology
14				تطبيقات الحاسب في دراسة مصادر المياه	Watershed hydrologic processes and models Watershed hydrologic processes and models		Wr-2-Watershed Hydrology and modeling
15				تجميع مياه الأمطار			Wr-3-Rainwater Harvesting
16				نمذجة المياه الجوفية		هيدرولوجيا المياه الجوفية	Wr-4-Groundwater

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering  
**Program Specification**



							Flow and modeling
	Conventional Wastewater Treatment Treatment and Sanitation Wastewater Treatment Plants Design and Engineering	Wastewater Treatment Engineering -	- هندسة الصرف الصحي -	عمليات معالجة المخلفات السائلة الطرق الاقتصادية لمعالجة مياه الصرف ا معالجة مياه الصرف معالجة المخلفات الصناعية السائلة عمليات الهندسة الصحية تصميم محطات معالجة المخلفات السائلة تشغيل وصيانة محطات معالجة المخلفات السائلة هندسة الصرف الصحي معالجة المخلفات السائلة الصناعية عمليات الهندسة الصحية (2) الصرف الصحي للمناطق المنعزلة	Wastewater treatment: from disposal to resource recovery	المعالجة البيولوجية للمياه العادمة المعالجة الفيز وكيميائية	Sa-1- Wastewater Treatment

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

				عمليات الهندسة الصحية (1) هندسة مياه الشرب مشروعات تخزين المياه نظم شبكات الأنابيب (متقدم) نظم شبكات الأنابيب			Sa-2-Drinking Water Treatment
				الكيمياء والميكروبيولوجيا الصحية ميكروبيولوجيا	Environmental microbiology	كيمياء وميكروبيولوجيا المياه	Sa-3-Microbiology
				إعادة الاستخدام الآمن للمياه إعادة استخدام المخلفات السائلة إعادة استخدام المخلفات السائلة في الري ترشيد وتعظيم استخدام مياه الري عمليات تدوير المياه			Sa-4-Reuse of treated wastewater and sludge

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

				التحكم في مياه الصرف الصناعي التحكم في تلوث المسطحات المائية تلوث مصادر المياه تلوث مصادر المياه (متقدم) التحكم في تلوث المسطحات المائية تحليل المياه والمخلفات السائلة			Sa-5-Water quality control
			إدارة النفايات الصلبة	التحكم في المخلفات الخطرة التحكم في المخلفات الصلبة			Env-1-Solid and Hazardous waste Management
				كيمياء الهندسة الصحية			Env-2-Chemistry and Biology of Environment
	Risk Mitigation		الحقوق المائية و فض النزاعات إدارة الموارد	التأثير البيئي لمشروعات الري والصرف	Environmental Management		Env-3-ESIA

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

				الدراسات الاقتصادية والبيئية والاجتماعية للمشروعات المائية	policy and laws (3 units):		
		Global Climate Change: Impacts and Adaptation					Env-4-Climate change
	Water Transport and Distribution Urban Drainage and Sewerage Urban Water Systems Advanced Water Transport and Distribution		هندسة الامداد بالمياه	توزيع وتخزين مياه الشرب هندسة تنقية المياه عمليات التشغيل نظم توزيع مياه الشرب تنقية المياه الطرق المتقدمة لمعالجة المياه هندسة مصادر المياه	Urban water Resilience, sustainability and water resources development Water, models and decision making	هندسة مصادر المياه	Hyd-1-Urban water supply
			المنشآت المائية المتقدمة	تطبيقات الحاسب في تصميم المنشآت المائية	Dams, Reservoirs and their sustainability Sediment	تصميم المنشآت المائية	Hyd-2-Design of Dams

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

					transport physics and modeling Dams, reservoirs, and their sustainability		
				الإدارة المائية للبيئة الساحلية هندسة وحماية الشواطئ	Coastal processes		Hyd-3-Coastal Engineering
				منشآت الري المطور تصميم وتنفيذ شبكات الصرف الزراعي تطوير نظم التحكم والإدارة لمياه الري تصميم منشآت الري في القنوات الصغيرة الاحتياجات الزراعية للمياه والموازنة المائية في مصر			Hyd-4-Irrigation structures

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

				تصميم السدود الصغيرة تصميم منشآت الري (متقدم) التسرب في المنشآت الهيدروليكية			
	Urban Drainage and Sewerage			شبكات الصرف الصحي مياه الصرف في المناطق المنعزلة نظم تجميع مياه الصرف انشاء وصيانة نظم شبكات الصرف الصحي	Water & sanitation in developing countries		Hyd-5-Urban Drainage and Sewerage network
		Master's Thesis		مشروع دبلوم الهندسه الصحيه تقرير علمي ماجستير الهندسه في الهندسه الصحيه رسالة ماجستير العلوم في الهندسه الصحيه رسالة الدكتوراه في		رساله جامعيه (9) ساعات معتمده	Diploma project and MSc thesis

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering  
**Program Specification**



				الهندسة الصحية			
				مشروع دبلوم في منشآت الري مشروع دبلوم في هندسة مصادر المياه تقرير علمي ماجستير الهندسة في الري والهيدروليكا رسالة ماجستير العلوم في هندسة الري والهيدروليكا رسالة الدكتوراه في هندسة الري والهيدروليكا			

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

ملحق (6) مسح الرؤية والرسالة والاهداف البرامج المعتمدة المماثلة لبرنامج الهندسة المدنية

### Annex (6) Survey/ Mapping of Vision, Mission and Objectives of Similar Accredited Programs at International Universities (Benchmarks) for Master of Science in Water and Environmental Engineering program

	The 1st Program	The 2nd Program	The 3rd Program	The 4th Program	The 5th Program	The 6th Program
<b>Country</b>	IHE-Delft	Khalifa	دمشق	Alexandria	Stanford	Jordanian
<b>University</b>	IHE Delft	College of Engineering	كلية الهندسة المدنية	كلية الهندسة	School of Eng.- civil and env. Eng.	كلية الهندسة
<b>Faculty</b>	Urban Water and Sanitation:  Sanitary Engineering- Delft based; Joint program with Univalve, Colombia  Water Supply Engineering Delft based	MSc In Water and Environmental Engineering	ماجستير في الهندسة المائية  ماجستير في الهندسة الصحية البيئية	هندسة الري والهيدروليكا  الهندسة الصحية	MSc. In Environmental Engineering specialized in Hydrology and water resources:	درجة الماجستير في الهندسة المدنية- مياه وبيئة

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

	Urban Water Engineering and Management					
<b>Department/ Program</b>	The Netherlands	Emirate	Syria	Egypt	USA	Jordan
<b>Study Duration</b>	18months	18months	2yrs	2yrs	2yrs	18months
<b>Program Accrediting Body</b>	This Program is accredited by the Accreditation Organization of the Netherlands and Flanders (NVAO)	All academic programs at Khalifa University are accredited with the Commission for Academic Accreditation of the UAE Ministry of Education and Accreditation Board for Engineering and	لا يوجد معلومات	تم إنشاء وحدة ضمان الجودة بكلية الهندسة – جامعة الإسكندرية وتشكيل المكتب التنفيذي للوحدة بقرار مجلس الكلية بتاريخ 2005/8/9 وتتبع عميد الكلية، مقر الوحدة بالدور الرابع بمبنى الهندسة الكهربائية بالكلية.	Accreditation Board for Engineering and Technology (ABET)  Environmental Engineering degree was ABET accredited	حصلت أقسام الهندسة (الكيميائية والكهربائية والميكانيكية) على شهادة الاعتماد العالمية من مجلس الاعتماد للهندسة والتكنولوجيا (ABET) الأمريكي حتى العام 2022. ووفقا للاعتماد وتعامل (ABET) العالمي شهادات خريجي هذه الأقسام كأى شهادة في جامعة أمريكية معتمدة،

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

		Technology, Inc. (ABET) accreditation for the new programs is underway, with 86% of undergraduate programs having received or are eligible for ABET accreditation. All academic programs at KU are accredited with the CAA of the UAE Ministry of Education for the new programs is underway.				لتكون "الأردنية" من الجامعات القليلة التي تحصل على هذا الاعتماد خارج الولايات المتحدة الأمريكية.
<b>Website Link</b>	<a href="https://www.un-">https://www.un-</a>	<a href="https://www.ku.a">https://www.ku.a</a>	<a href="http://damascus">http://damascus</a>	<a href="https://eng.alexu">https://eng.alexu.</a>	<a href="https://cee.stanfo">https://cee.stanfo</a>	<a href="http://engineerin">http://engineerin</a>

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

	<a href="http://ihe.org/msc-programmes">ihe.org/msc-programmes</a>	<a href="http://c.ae/academics/graduate-programs">c.ae/academics/graduate-programs</a>	<a href="http://university.edu.sy/civil/?lang=1&amp;set=3&amp;id=418">university.edu.sy/civil/?lang=1&amp;set=3&amp;id=418</a>	<a href="http://edu.eg/index.php/departments/civil">edu.eg/index.php/departments/civil</a>	<a href="http://rd.edu/academics-admission/graduate-phd-and-masters-degree-programs/environmental-engineering">rd.edu/academics-admission/graduate-phd-and-masters-degree-programs/environmental-engineering</a>	<a href="http://g.ju.edu.jo/ar/arabic/AccreditationDocumentsForms/Forms/Documents.aspx">g.ju.edu.jo/ar/arabic/AccreditationDocumentsForms/Forms/Documents.aspx</a>  <a href="http://graduatedstudies.ju.edu.jo/ar/arabic/Lists/FacultyAbstract/School_FacultyAbstract.aspx">http://graduatedstudies.ju.edu.jo/ar/arabic/Lists/FacultyAbstract/School_FacultyAbstract.aspx</a>
<b>Department Vision</b>	Vision  IHE Delft Institute for Water Education envisions a world free of poverty and injustice, in which people manage their water and environmental	To be a world class center of excellence in engineering education, research, and knowledge transfer and be a		الرؤية:  أن تكون كلية الهندسة جامعه الاسكندريه رائده فى العلوم الهندسية على مستوى الشرق الاوسط وافريقيا فى مجال التعليم والبحث العلمي وخدمه المجتمع وذلك من خلال	Graduate Programs  Our graduate students are innovators,	

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

	resources sustainably and equitably.	catalyst for economic development in the Emirate of Abu Dhabi and the UAE.		تميز أعضاء هيئة التدريس بها وتوفير برامج التعليم والبحث والامكانيات المتميزه المرتبطه بالبيئه المحيطه خاصه الصحراويه والبحريه.	change agents and pioneers in engineering research. The Equity and Inclusion Initiatives team is proud to support each graduate student in their research, outreach, self-advocacy and well-being. Our aim is to provide ... resources they need to succeed in their studies and in life beyond the School of Engineering. Graduate Programs ...	
--	--------------------------------------	--	--	--	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

					<p>Prospective Graduate Programs</p> <p>Considering an advanced degree? Get a glimpse of your own graduate career at Stanford Engineering. The Equity and Inclusion Initiatives team hosts a ... in engineering. From a one-day conference to an intensive eight-week summer research program, students gain invaluable exposure to life as a graduate student</p>
--	--	--	--	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

					<p>t. Our programs offer participants access to research labs, application workshops ...</p> <hr/> <p>Program At a Glance</p> <p>The Bay Area Graduate Pathways to STEM (GPS) aims to inspire diverse talent to become the next generation of innovative leaders through advanced engineering degrees. Virtual Program, Saturday,</p>
--	--	--	--	--	---

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

					February 20, 2021 Bay Area GPS is a one-day conference where students attend ... the benefits of pursuing an advanced degree, both MS and PhD, while also preparing for graduate school and the application process. GPS promotes graduate school opportunities to ...	
<b>Department Mission</b>	Mission IHE Delft works in	The College of Engineering serves the Emirate	الرؤية : الارتقاء بالبحث	الرسالة : تأهيل الكوادر الهندسية المتميزة القادرة على العمل الجماعي وابتكار وأبداع من خلال		

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

	<p>partnership to strengthen capacity in the water sector to achieve global sustainable development.</p>	<p>of Abu Dhabi, the nation, and the world by providing students with holistic education underpinned by the principle of engineering with a purpose, thus empowering them to be outstanding leaders in discovering new knowledge as a catalyst for business innovation, particularly towards the Abu Dhabi Vision 2030. The College also plays an integral role towards this</p>	<p>العلمي للمساهمة في تعزيز المكانة العلمية والتقنية المتميزة لجامعة دمشق.      الرسالة :      تطوير الشخصية البحثية عبر توفير بيئة بحثية محفزة للباحثين في جامعة دمشق وخلق ظروف ملائمة للاستفادة المثلى من مخرجات البحث في خدمة التنمية.</p>	<p>مواصلة التعليم والتعلم والتدريس والبحث العلمية وتداول المعرفة وفق افضل المعايير الاكاديمية والمهنيه لخدمه احتياجات المجتمع المحلي والقومي والدولى وتشجيع النشر العلمى والتقنى والاسهام فى تنميه القدرات المعرفيه لافراد المجتمع ومؤسساته وتمكينها من التعليم المستمر</p>		
--	--	--	---	---	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

		vision by conducting cutting edge fundamental, multidisciplinary and translational research in key strategic areas such as information and communication technology, aerospace, transport and logistics, healthcare, and energy and the environment.				
<b>Department Objectives</b>	Ambition  Through our overarching work on capacity development, IHE Delft aims to make a		الأهداف :  1. ربط البحث العلمي بأهداف الجامعة وخطط التنمية الوطنية	الاهداف :  - اعداد خريج ملم بالحديث من العلوم الاساسيه والهندسيه والانسانيه		

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

	<p>tangible contribution to achieving all Sustainable Development Goals in which water is key.</p>		<p>2. نقل وتوطين التقنية الحديثة والمشاركة في تطويرها وتطويرها لتلائم الظروف المحلية لخدمة أغراض التنمية</p> <p>3. إنشاء قاعدة معلومات للأبحاث الجاري تنفيذها والأبحاث التي تم تنفيذها في الجامعة وتبادل المعلومات البحثية مع الجامعات ومراكز الأبحاث الأخرى</p> <p>4. اقتراح خطة البحوث السنوية للجامعة</p> <p>5. دراسة مشروعات البحوث والدراسات</p>	<p>1 - اعداد خريج ملم بوسائل التكنولوجيا الحديثة وتكنولوجيا المعلومات وكيفية التعامل معها</p> <p>2 - اعداد خريج قادر على اتخاذ القرار والتعامل مع الازمات وحل المشكلات</p> <p>3 - تزويد الطلاب بالقدرات اللغوية اللازمة للاستفادة من عولمة المعرفة</p> <p>4 - اعداد خريج قادر على توضيح رؤيته والاتصال بالمجتمع المحيط والتأثير فيه .</p> <p>5 - اعداد خريج قادر على المنافسة في سوق العمل في ظل الظروف</p>		
--	--	--	---	---	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

			ومتابعة تنفيذها وتحكيماها والصراف عليها وفق القواعد المنظمة لذلك  6.تنظيم عملية الاتصال بمراكز البحوث خارج الجامعة المحلية والأجنبية وتنمية التعاون معها  7.تنسيق العمل بين الكليات ومراكز الأبحاث في الجامعة وتشجيع الأبحاث المشتركة بين الأقسام والكليات لرفع كفاءة الأبحاث العلمية بالجامعة  8.تشجيع أعضاء الهيئة التدريسية على	المتغيرة للمجتمع الدولي  6- اعداد خريج قادر على تطبيق اساليب التفكير العلمى الهندسى والتحليل والاستنباط ولديه  6-الرغبة والقدرة على التعلم المستمر .  7-اعداد كوادر علميه قادره على البحوث الاكاديميه والتطبيقية فى التخصصات الهندسية المختلفه.  8- المساهمه فى خدمه المجتمع والبيئة من خلال المشاركة فى وضع الرؤى المستقبلية والاستراتيجيات اللازمه للتنمية		
--	--	--	--	--	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

			<p>إجراء الأبحاث العلمية          المبتكرة وتهيئة          الوسائل والإمكانيات          البحثية لهم وتمكينهم          من إنهاء أبحاثهم في          جو علمي ملائم</p> <p>9. تنمية جيل من          الباحثين الشباب          وتدريبهم على إجراء          البحوث وإثرائها</p> <p>10. دعم البحث          العلمي وتهيئة كافة          الوسائل والإمكانيات          البحثية للباحثين</p> <p>11. تعزيز التعاون في          مجال الأبحاث بين          الجامعة ومؤسسات          القطاعين العام          والخاص</p> <p>12. مساعدة القطاعات</p>	<p>المستدامه خاصه في          البيئتين الصحراوييه          والبحريه</p>		
--	--	--	---	---	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

			<p>المختلفة في القطر العربي السوري في علاج مشاكلها وتطوير أدائها عن طريق تنفيذ الأبحاث العلمية التطبيقية</p> <p>13. تشجيع نشر البحوث في المجالات العلمية</p>			
<b>Program Mission</b>		<p>Program overview:</p> <p>The degree of Master of Science in Water and Environmental Engineering (M.Sc. in WEE) is awarded for successfully completing the requirements of a</p>		<p>سمات الحاصل على الماجستير: 1 إجابة تطبيق أساسيات ومنهجيات البحث العلمي واستخدام أدواته المختلف تطبيق المنهج التحليلي والتطبيقي واستخدامه في مجال التخصص. تطبيق المعارف المتخصصة ودمجها مع المعارف</p>		

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

		<p>program of study, which include taught courses as well as a research thesis. The thesis is an independent investigation of specialized areas within the general field of water and environmental engineering. The M.Sc. in WEE program aims to provide students with a comprehensive understanding of the challenges behind one of the foundations of sustainable development – ensuring sufficient and equitable access to clean</p>		<p>ذات العلاقة في الدراسات البحثية إظهار الوعي بالمشاكل الجارية والرؤى الحديثة في مجال التخصص . تحديد المشكلات البحثية وإيجاد حلولاً لها. إتقان نطاق مناسب من المهارات المهنية المتخصصة، واستخدام الوسائل التكنولوجية المناسبة بما يخدم الدراسات البحثية. التواصل بفاعلية والقدرة على قيادة فريق العمل لظروف المشكلات وضع مقترحات طبقاً للاخذ في الاعتبار المواد المتاحة بما يؤدي الى أعلى استفادة منها عند التطبيق [٢]. إظهار الوعي بدوره في تنمية</p>		
--	--	--	--	---	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

		<p>water.          Furthermore, the program gives candidates the opportunity to deepen their knowledge in one of two specialization tracks of WEE, namely Water and Environmental Technologies or Water and Environmental Resources, and contribute to the process of discovery and knowledge creation through the conduct of original research. Candidates for this degree are taught and supervised by</p>		<p>المجتمع والحفاظ على البيئة [7]. التصرف بما يعكس الالتزام بالنزاهة والمصداقية والالتزام بقواعد البحث العلمي .. وقادرا على التعليم المستمر تنمية ذاته أكاديميا وبحثيا</p> <p>- المعايير القياسية العامة:</p> <p>2 - المعرفة والفهم</p> <p>A: بانتهاء دراسة برامج الماجستير يجب أن يكون الحاصل على الماجستير على فهم ودراية بكل من: النظريات والأساسيات المتعلقة بمجال التعلم وكذا في المجالات ذات</p>	
--	--	--	--	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

		<p>experienced faculty and are expected to demonstrate initiative in their approach and innovation in their work. In addition to successfully completing the taught course component of the program, candidates prepare and present a thesis on their chosen area. Research may be undertaken in several topics corresponding to the areas of focus identified by the University.</p>		<p>العلاقة.</p> <p>a.1. التأثير المتبادل بين الدراسات البحثية وانعكاسها على البيئة .</p> <p>a.2. التطورات العلمية في مجال التخصص</p> <p>a.3. المبادئ الأخلاقية والقانونية للبحث العلمي في مجال التخصص.</p> <p>a.4. مبادئ وأساسيات الجودة في تطبيقاته البحثية في مجال التخصص</p> <p>a.5. أساسيات وأخلاقيات البحث العلمي</p> <p>a.6. المهارات</p>		
--	--	---	--	---	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering  
**Program Specification**



				<p>الذهنية B :بانتهاة دراسة برنامج الماجستير يجب أن يكون الحاصل على الماجستير قادرا على: تحليل وتقييم المعلومات في مجال التخصص والقياس عليها لحل المشاكل.</p> <p>b.1. اقتراح حلول للمشاكل المتخصصة مع عدم توافر بعض المعطيات</p> <p>b.2. الربط بين المعارف المختلفة لحل المشاكل المهنية .</p> <p>b.3. إجراء دراسة بحثية و/أو كتابة دراسة علمية منهجية حول مشكلة بحثية</p>	
--	--	--	--	---	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

				<p>b.4 .تقييم المخاطر          في الممارسات المهنية          في مجال التخصص</p> <p>b.5 .التخطيط لتطوير          الأداء في مجال          التخصص</p> <p>b.6 . للظروف          المحيطة تقديم          مقترحات لاتخاذ          القرارات المهنية طبقا          b.7 -. المهارات المهنية</p> <p>C بانتهاء دراسة برنامج          الماجستير يجب أن          يكون الحاصل على          الماجستير قادرا على:          إتقان المهارات البحثية          الأساسية والحديثة في          مجال التخصص.</p> <p>c.1 كتابة وتقييم</p>	
--	--	--	--	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

				<p>.التقارير والابحاث 2.c. .          تقييم الطرق والأدوات          المستخدمة في حل          المشاكل والدراسات          البحثية 3.c. .          المهارات العامة المنقولة</p> <p>D : بانتهاء دراسة          برنامج الماجستير يجب          أن يكون الحاصل على          الماجستير قادرا على:          التواصل الفعال بأنواعه          المختلفة.</p> <p>استخدام تكنولوجيا          المعلومات بما يخدم          تطوير الاساليب البحثية.          d.2.التقييم الذاتي          وتحديد احتياجاته          التعليمية الشخصية</p> <p>d.3. استخدام المصادر          المختلفة للحصول على</p>
--	--	--	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

				المعلومات والمعارف . d.4 وضع قواعد ومؤشرات تقييم الأداء البحثي . d.5 لظروف الدراسة وقيادة فريق طبقا ، d.6 العمل في فريق إدارة الوقت بكفاءة. d.7.التعليم الذاتي والمستمر		
<b>Program Objectives</b>		<b>PROGRAM EDUCATIONAL OBJECTIVES</b> The educational goals (objectives) of the MSc in Water and Environmental Engineering program are to produce				

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

		<p>graduates who will have:</p> <ul style="list-style-type: none"> <li>-An ability to identify and address current and future societal problems related to water, waste, and the environment within a broader framework of sustainable development.</li> <li>-An ability to apply a multi-disciplinary approach to conceive, plan, design, and implement solutions to problems in the field of water and environmental</li> </ul>			
--	--	---	--	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

		<p>engineering.</p> <p>-An understanding of the impact of solutions to water and environmental engineering problems in a global, economic, environmental, and societal systems context.</p> <p>-An understanding of the value of technical and scientific scholarship, service to society, leadership and lifelong learning required to further their career aspirations.</p>			
--	--	---	--	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

ملحق ( 7 ) مواءمة رسالة وأهداف البرنامج مع رؤية ورسالة واهداف الكلية والجامعة  
 Annex (7) Mapping of mission and objective of the program with vision, mission and objectives of faculty, and university

### Mapping of program vision with Department, faculty, and university vision

University Vision	Faculty Vision	Department vision	Program vision
<b>Sana'a University aspires to achieve a national leading role in teaching, learning, scientific research and community service; and to be among the best regional universities and the foremost house of expertise and think tank in Yemen.</b>	<b>To excel in engineering education &amp; scientific research with distinction at the local and regional levels.</b>		To be a distinguished Master program in Water and Environmental Engineering locally and regionally.

### Mapping of program mission with Department, faculty and university mission

University Mission	Faculty Mission	Department Mission	Program Mission
<b>To contribute to the sustainable development efforts by providing an accredited higher education environment and</b>	<b>To provide excellent and accredited engineering education to meet the development needs and match</b>	<u>To provide students with good quality Civil Engineering education that prepares them to be qualified and committed professionals who</u>	To graduate distinguished Master's students in the field of Water and Environmental engineering through a strong academic program, qualified staff, and adequate

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

<p>excellent research services within a fruitful national partnership based on transparency, professionalism and creativity.</p>	<p>the labor market requirements locally and regionally.</p>	<p><u>could pursue graduate studies and research and play a leading role in the sustainable development of the country and its integration into the regional economy.</u></p>	<p>research environment that meet local development requirements as well as regional labor market needs.</p>
--	--	---	--

### Mapping of program objectives with Department, faculty, and university objectives

University Objectives	Faculty Objectives	Department Objectives	Program Objectives
<p>To provide specialized and in-depth academic opportunities for students in different fields of knowledge to meet the country's needs of specialties, technicians and experts, with special focus on the following:</p>	<p>To offer study programs in various fields of knowledge and equip students with required knowledge and scientific and know-how skills to utilize them in resolving problems effectively and efficiently.</p>	<p>1. <u>provide a high-quality educational experience through an appropriate depth over the full range of core engineering subject areas for undergraduate and postgraduate programs.</u></p>	<p>1.To provide specialized studies with encouraging fundamental and applied research in different Water and Environmental engineering disciplines.            2.To bridge the gap between the academic educational and industrial &amp; technological environments.            3.To develop and improve the academic and educational level at the Faculty of Engineering in the field of Water and Environmental engineering.            4.To provide graduates with up-to-date advanced knowledge and skills needed to</p>

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

			<p>understand and deal create high-quality systems and achieve strong problem-solving abilities to challenges in the Water and Environmental engineering field.</p> <p>5.To graduate researchers in the Water and Environmental engineering disciplines who can pursue further studies and research and contribute to the scientific research community.</p> <p>6.To provide graduates with the ability to contribute effectively to the Water and Environmental engineering profession by applying ethical practices, strong communication skills, ability to share innovative and clear ideas and capacity for pursuing further education through lifelong learning.</p>
<b>To boost the level and quality of preparation and qualification tasks.</b>	<b>To develop positive trends towards engineering science and its accelerating developments and enable</b>	2. applying the quality assurance standards and targeting the academic accreditation levels (local, regional and international	

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

	<b>students to use the techniques and methods of conducting scientific research in engineering fields.</b>	levels).	
<b>To create a general culture aiming at developing the elements of sound Islamic personality and the proper cognitive and scientific training.</b>	<b>To develop skills of scientific, innovative and critical thinking as well as the concept of continuous self-education.</b>	3. Serving the community and labor market needs through the consultancy, research, laboratory tests and training services.	
<b>To stabilize the true Islamic vision emanating from the broad horizons of Islamic knowledge and its perception of the universe, man and life.</b>	<b>To strengthen scientific ties with national and international colleges, scientific bodies, and research &amp; development centers.</b>		
<b>To develop innovative and critical scientific thinking skills.</b>	<b>To provide technical and specialized studies and consultations to various state bodies and institutions, both public and semi-public, and utilize them in resolving the environment and society issues to promote sustainable development.</b>		
<b>To provide students with the</b>	<b>To develop a spirit of co-</b>		

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

<b>required knowledge and scientific and applied skills for solving problems effectively and efficiently.</b>	<b>operation, group work, effective leadership, sense of responsibility, and ethical commitment.</b>		
---	--	--	--

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

ملحق (8) المساقات الرئيسية واوزانها الفرعية لبرنامج ماجستير هندسة المياه والبيئة  
 Appendix (8) Main Themes/Sub-Themes with Relative weight for Water and Environmental Engineering Program.

No.	Themes	Credit Hours	No. of Courses	Relative weight for Theme	Sub-Themes
0	Core subjects		6		-
1	General Electives		1		-
2	Water Resources		5		-
3	Sanitation		5		-
4	Environment		4		-
5	Hydraulics		5		-
	<b>Total</b>			<b>100%</b>	

\* This total is the overall total of both Compulsory and Elective courses.

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

ملحق (9) توزيع مخرجات التعلم لبرنامج ماجستير هندسة المياه والبيئة مع المساقات الرئيسية

Appendix (9) P- ILOs Distribution to Main Themes for Master of Science in Water and Environmental Engineering program- Water and Environmental Engineering

No	PIL Os	Themes							
		Core subjects	General Electives	1st Theme	2nd Theme	3rd Theme	4th Theme	7th Theme	8th Theme
				Water Resources	Sanitation	Environment	Hydraulics		
1	A1		Statistical Analysis	Advanced Hydrology	WASH	Advanced Environmental Eng.	Advanced Hydraulics		
2	A2		Advanced mathematics	Desalination and Membrane Technology	Wastewater Treatment	Solid and Hazardous Waste Management	Urban water supply		
3	A3		Computer application in Water and Environment	Watershed Hydrology and modeling	Drinking Water Treatment	Chemistry and Biology of Environment	Design of Dams		
4	A4		GIS	Rainwater Harvesting	Microbiology	ESIA	Coastal Engineering		
5	B1		Flood disaster risk management	Groundwater Flow and modeling	Reuse of treated wastewater and	Climate change	Irrigation structures		

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

No	PIL Os	Themes							
		Core subjects	General Electives	1st Theme	2nd Theme	3rd Theme	4th Theme	7th Theme	8th Theme
				Water Resources	Sanitation sludge	Environment	Hydraulics		
6	B2		Case study project (Selected Topics in Water and Environmental Engineering)	Water Resources	Water quality control		Urban Drainage and Sewerage network		
7	B3								
8	B4								
9	C1								
10	C2								
11	C3								
12	C4								
13	D1								
14	D2								
15	D3								

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			



University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

No	PIL Os	Themes							
		Core subjects	General Electives	1st Theme Water Resources	2nd Theme Sanitation	3rd Theme Environment	4th Theme Hydraulics	7th Theme	8th Theme
16	D4								

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

ملحق (10) موائمة مخرجات تعلم برنامج ماجستير هندسة المياه والبيئة مع المقررات

**Appendix (10) Mapping Program Intended Learning Outcomes with courses for Master of Science in Water and Environmental Engineering program, Water and Environmental Engineering**

Course Name	Program Intended Learning Outcomes (P-IOLs)															
	(A)				(B)				(c)				(D)			
	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Advanced Environmental Eng.																
Advanced Hydrology																
Advanced Hydraulics																
Research Methodology																
WASH																
Statistical Analysis																
General Electives																
Specialized subject																

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

Course Name	Program Intended Learning Outcomes (P-IOLs)															
	(A)				(B)				(c)				(D)			
	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Specialized subject																
Specialized subject																
Specialized subject																
<b>THESIS599</b>																

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

ملحق (11) موازنة مخرجات تعلم برنامج ماجستير هندسة المياه والبيئة مع المرجعيات

**Appendix (11) Mapping Program Intended Learning Outcomes with the benchmarks for Master of Science in Water and Environmental Engineering program**

(IOLs) Intended Learning Outcomes																Standards and Benchmarks
(A)				(B)				(c)				(D)				
A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4	
																N/A

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:  
 Master of Science in Water and Environmental Engineering



## Program Specification

ملحق (12) مواءمة أهداف البرنامج مع مخرجات التعلم المقصودة لبرنامج ماجستير هندسة المياه والبيئة  
 Annex-12, Alignment of Water and Environmental Engineering Program Objectives with Program Intended Learning Outcomes

Program Objectives رقم ونص المعيار	Program Intended Learning Outcomes (PILOs) رموز مخرجات التعلم للبرنامج														
	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3
Upon successful completion of an undergraduate Water and Environmental Engineering program, graduates should be able to:															

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

**University of Sana'a**  
**Faculty of Engineering**  
**Department: Civil Engineering**  
**Title of the Program:**  
**Master of Science in Water and Environmental Engineering**



## Program Specification

### Program Intended Learning Outcomes (PILOs):

A. Knowledge and Understanding:

Head of the Department	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			