

Academic Program Specification Form For Colleges and Institutions

University: Northern Technical University

College / Institute: Technical Institute / Mosul

Department: Department of Water Resources Technologies

Date of Form Completion: 12 / 9 / 2023

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Date: 12/9/2023
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TEMPLATE FOR PROGRAMME SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAMME SPECIFICATION

This Programme Specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It is supported by a specification for each course that contributes to the programme.

1. Teaching Institution	Northern Technical University
2. University Department/Centre	Mosul Technical Institute
3. Programme Title	<i>Department of Water Resources Technologies</i>
4. Title of Final Award	Technical Diploma
5. Modes of Attendance offered	Courses
6. Accreditation	WFME/NLNAC
7. Other external influences	Summer training for first-year students
8. Date of production/revision of this specification	12 / 9 / 2023
9. Aims of the Programme	
The program aims to graduate qualified technical personnel to survey agricultural land, calculate the quantities of earthworks for irrigation and drainage projects, monitor and organize irrigation works, determine irrigation water needs, carry out works, maintain and operate irrigation and drainage projects, install, operate and maintain sprinkler and drip irrigation systems	

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A1. Knowledge and Understanding:

- A1. Broad-based education to understand the global and economic impact of engineering solutions.
- A2. Ability to work in multidisciplinary teams.
- A3. The possibility of applying cognitive sciences such as mathematics, pure sciences.
- A4. Identify the types of dams and the water storage mechanism
- A5. The ability to design systems to meet the required needs within realistic economic determinants.
- A6. Possibility to design and implement experiments, analyze results and translate them realistically.

B. Subject-specific skills:

- B1. Using the least teaching methods in line with the level of students and allowing the students to discuss.
- B2. Using modern and advanced means to deliver the largest amount of knowledge to the student.
- B3. Installation, operation and maintenance of sprinkler and drip irrigation systems
- B4. Using the computer in his field of specialization in drawing and analysis
- B5. Activating the role of educational guidance in the matter.

Teaching and Learning Methods

- 1- Using modern graphic information sources to illustrate the idea
- 2- The use of miniature models of irrigation systems during the theoretical explanation of the educational material
- 3- Scientific visits to irrigation and dam projects to enhance the theoretical aspect and learn how to apply it in reality
- 4- Training on water resources software and analysis methods
- 5- Conducting sudden exams.
- 6- Assigning students assignments, such as writing research papers, so that students acquire skills for self-learning and presentation.
- 7- Informing students of the curriculum books and auxiliary books that they need in the course vocabulary through a questionnaire for previous years to improve the curriculum, improve the performance of the teachers and raise the level of the student

Assessment methods

The assessment includes theoretical and practical tests, daily and monthly, for each educational subject, in addition to the reports that the student is assigned to prepare after each scientific visit.

C. Thinking Skills:

C1. Learn how to successfully manage irrigation projects

C2. Learn how to deal with engineering cadres and workers

C3. Learn to keep appointments and schedule them

C4. The ability to make decisions

Teaching and Learning Methods

1- Awareness lectures for students

2- Field visits to irrigation projects and discussion of the work mechanism with the engineering cadres present at the site

3- Summer training in government departments

Assessment methods

1- Follow up the attendance and absence of students

2- Follow up the student's behavior while he is in the educational institution

3- Follow up on the presence of students at the training site and see the rate of interaction of each student with the tasks assigned to him at the training site

4- Laboratory performance

5- Presentation of scientific reports

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Develop and develop the student's ability and ability to use computer programs in the field of specialization.

D2.. Develop the student's ability and ability to deal with modern technologies related to the course vocabulary.

D3. Develop and develop the student's ability and ability to face problems and dilemmas and find appropriate solutions to them.

D4. Develop and develop the student's ability and ability to translate academic information into practical reality.

Teaching and Learning Methods

Use modern technologies and contemporary skills to advance in the field of water resources engineering

Assessment Methods

- 1- Individualizing part of the exam questions that require depth of thinking, explanation and accuracy of observation.
- 2- Students' participation in the lecture.
- 3- Extra-curricular duties

11. Programme Structure

1. أفراد جزء من الاسئلة الامتحانية التي تتطلب عمق التفكير والتعليل ودقة الملاحظة.
2. مشاركات الطلبة في المحاضرة.
3. الواجبات اللاصفية

المناهج الدراسية لفرع: الري و البزل

المستوى الدراسي (الأول)						
نوع المتطلب	أسم المقرر	عدد الساعات النظرية	عدد الساعات العملية	عدد الوحدات	المعهد إن وجد	الرمز
متطلبات الجامعة (12) وحدة إجباري	حقوق الإنسان	Human rights	1	-	1	NTU100
	الديمقراطية	Democracy	1	-	1	NTU106
	لغة إنكليزية	English language	2	-	2	NTU101
	مبادئ الحاسوب 1	Computer principles 1	1	2	3	NTU102
	مبادئ الحاسوب 2	Computer principles 2	1	2	3	NTU103
	اللغة العربية	Arabic language	2	-	2	NTU104
	رياضة (اختياري)	Sport	1	1	2	NTU105
متطلبات المعهد (7) وحدة إجباري	رياضيات 1	Mathematic 1	2	-	2	TIMO110
	رياضيات 2	Mathematic 2	2	-	2	TIMO112
	معامل ميكانيك	Mechanical workshop	-	3	3	TIMO111
متطلبات القسم (35) وحدة إجباري	مبادئ ميكانيك الموائع	Fluid mechanics principles	2	2	4	WRTI122
	تطبيقات ميكانيك الموائع	Fluid mechanics applications	2	2	4	WRTI123
	ميكانيك هندسي	Engineering mechanics	2	-	2	WRTI138
	مقاومة مواد	Strength of material	2	-	2	WRTI137
	مبادئ الري	Irrigation principles	1	2	3	WRTI135
	تطبيقات الري	Irrigation applications	1	2	3	WRTI136
	رسم هندسي 2D	Engineering drawing 2D	-	3	3	WRTI126
	رسم هندسي 3D	Engineering drawing 3D	-	3	3	WRTI127
	مقدمة في المساحة	Introduction to survey	1	3	4	WRTI128
	تطبيقات المساحة	Survey applications	1	3	4	WRTI129
	معامل مدني	Civil workshop	-	3	3	WRTI134
	مواد بناء (اختياري)	Construction material	1	2	3	WRTO130
	جيولوجيا (اختياري)	Geology	1	2	3	WRTO131
	تلوث المياه (اختياري)	Water pollution	1	2	3	WRTO133
	نظم المعلومات الجغرافية (اختياري)	Geographic Information Systems GPS	1	2	3	WRTO132
مجموع وحدات الفصل الدراسي الأول و الثاني للمستوى الأول لفرع الري و البزل		الإجبارية		الاختياري		
		54		14		

المستوى الدراسي (الثاني)						
نوع المتطلب	أسم المقرر	عدد الساعات النظرية	عدد الساعات العملية	عدد الوحدات	المعهد إن وجد	الرمز
مطلوبات المعهد (4) وحدة (إلزامي)	لغة إنكليزية	2	-	2	-	NTU200
	أخلاقيات المهنة	2	-	2	-	NTU201
متطلبات القسم (48) وحدة إجبارية	مقدمة في الهيدرولوجي	1	2	3	-	WRTI241
	هيدرولوجية المياه السطحية	1	2	3	-	WRTI242
	شبكات الري والبزل	1	3	4	-	WRTI243
	المنشآت الهيدروليكية	1	3	4	-	WRTI244
	مقدمة في البزل	1	2	3	-	WRTI245
	تخطيط شبكات المبازل	1	2	3	-	WRTI246
	تقنيات الري بالرش	1	2	3	-	WRTI247
	تقنيات الري بالتنقيط	1	2	3	-	WRTI248
	أساسيات ميكانيك التربة	1	2	3	-	WRTI249
	تحريات التربة	1	2	3	-	WRTI250
	المواد الإنشائية	1	2	3	-	WRTI251
	المسح الكمي	1	2	3	-	WRTI240
	حاسبة (أوتوكاد)	1	2	3	-	WRTI220
	حاسبة (مايكروسوفت أوفيس)	1	2	3	-	WRTI221
	المشروع 1	-	2	2	-	WRTI233
	المشروع 2	-	2	2	-	WRTI233
	استدامة المياه (اختياري)	1	2	3	-	WRTI235
	صيانة مشاريع الري والبزل(اختياري)	1	2	3	-	WRTI254
مجموع وحدات الفصل الدراسي الأول و الثاني للمستوى الثاني لفرع الري و البزل		الإجبارية		الاختيارية		
		52		6		

12. Personal Development Planning

The department strives to be a forerunner in the field of preparing and graduating assistant engineers (technical trainers) in the field of water resources engineering who take upon themselves the advancement of the agricultural and water reality by adopting modern technologies and participating in building and developing infrastructure, providing consultancy, expertise and technical support for planning and implementation programs, and they have the ability to Design, implementation and operation of projects of social benefit. The department also seeks to achieve an appropriate knowledge content for students that will make them able to assume the responsibilities of Iraq's needs of engineers in the future so that they will be able and efficiently to serve Iraq in sectors that need the specializations of environmental engineering.

13. Admission criteria .

- * A graduate of the preparatory school, the scientific branch
- * Admission is for both sexes (males and females).
- * The minimum acceptance rate is determined by the higher references represented by the Central Admission Department in the Ministry of Higher Education and Scientific Research.

14. Key sources of information about the program

- * The country's need for specializations.
- * Local trends.
- * The desire of the student or guardian.

Curriculum Skills Outline

Please check the boxes corresponding to the individual learning outcomes from the program being evaluated																			
Learning outcomes required from the program																			
year/level	Course Code	Course Name	Basic mother optional	Cognitive goals				Program specific objectives				Emotional and value goals				Transferred general and qualification skills (other skills related to employability and personal development)			
				1a	2a	3a	4a	1b	2b	3b	4b	1c	2c	3c	4c	1d	2d	3d	4d
second		Hydrology	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		irrigation facilities	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Objectives of Some Subjects

Article description:

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities. It must be linked to the description of the program

1. Educational Institution	Northern Technical University
2. Scientific Department / Center	Technical Institute / Mosul
3. Scientific Department / Center	Department of Water Resources Technologies/ Technical Institute - Mosul
4. Course name/code	irrigation
5. Forms of attendance available	1- Weekly lesson schedule (theoretical and practical) 2- Scientific discussions, seminars and other extra-curricular activities
6. Semester/year	Semester
7. Number of hours of study (total)	Semester
8. Date of preparation of this description	2023 / 9 /12

9. Course objectives
The course aims to acquaint the student with the methods of delivering water and using it to irrigate agricultural lands, And acquire the necessary skills to implement an irrigation project and its irrigation systems and how to conduct them

Course outcomes and methods of teaching, learning and assessment
<p>A- Cognitive goals</p> <p>A1- Introducing the science of irrigation, its benefits and types</p> <p>A 2- Identify the types of soils and their physical characteristics and how to address the problem of salinity</p> <p>A3- Designing an irrigation network for a specific field in line with environmental conditions</p>
<p>B - Skills objectives of the course.</p> <p>B1 - Using miniature models of irrigation systems to better communicate and consolidate information to the student</p> <p>B2 - Allow space for discussion with students using fewer teaching methods in line with the students' level</p> <p>B3 - Activating the role of educational guidance on the subject</p>
Teaching and learning methods

<p>1. Using modern graphic information sources to illustrate the idea</p> <p>2. Using miniature models of irrigation systems during the theoretical explanation of the educational material</p> <p>3. Scientific visits to irrigation and dam projects to enhance the theoretical aspect and learn how to apply it in reality</p> <p>4. Training on water resources software and analysis methods</p> <p>5. Conducting sudden exams.</p> <p>6. Assigning students assignments, such as writing research papers, so that students acquire skills for self-learning and presentation.</p> <p>7. Informing students of the curriculum books and auxiliary books that they need in the course vocabulary, including through a questionnaire for previous years to improve the curriculum, improve the performance of the teachers, and raise the level of the student.</p>
<p>Evaluation methods</p>
<p>The assessment includes theoretical and practical tests, daily and monthly, for each educational subject, in addition to the reports that the student is assigned to prepare after each scientific visit.</p>
<p>C- Emotional goals</p> <p>C1- Analyze, analyze and compare.</p> <p>C 2- Accuracy of observation and depth of thinking</p> <p>C 3 - the speed of information retrieval and the obvious conclusion.</p> <p>C4 - speed and accuracy of decision-making.</p>

Teaching and learning methods
<p>1. Awareness lectures for students</p> <p>2. Field visits to irrigation projects and discussion of the work mechanism with the engineering cadres present at the site</p> <p>Summer training in government departments</p>
Evaluation methods
<p>The assessment includes theoretical and practical tests, daily and monthly for each educational subject, in addition to the reports that the student is assigned to prepare after each scientific visit.</p> <p>.</p>
<p>D - Transferred general and qualifying skills (other skills related to employability and personal development).</p> <p>D1- Develop the student's ability and ability to use computer programs in the field of specialization.</p> <p>D2 - Develop the student's ability and ability to deal with modern technologies related to the course vocabulary.</p> <p>D3 - Develop the student's ability and ability to face problems and dilemmas and find appropriate solutions to them.</p> <p>D4- Develop the student's ability and ability to translate academic information into practical reality</p>

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10. Course structure

The week	The hours	Required learning outcomes	Unit name and/or topic	education method	Evaluation method
1	4	Learn about the benefits of irrigation and how to save water	The science of irrigation, its definition, the benefits of irrigation,	theoretical + practical	Classwork, non-class homework, short surprise exams, monthly exams

		during the irrigation process	an idea about the types of irrigation	
2	4	Teaching the student the types of soils and their properties and problems related to salinity	Soil, physical properties of soil, types of water in soil, ability of soil to conserve water, soil classification	theoretical + practical
3	4	Teaching the student the types of soils and their properties and problems related to salinity	Soil, physical properties of soil, types of water in soil, ability of soil to conserve water, soil classification	theoretical + practical
4	4	Training the student on how to estimate the appropriate quantities of water for each field and how to reduce water losses	Field capacity, wilting point, saturation, available and unavailable water	theoretical + practical
5	4	Teaching the student how to	Soil moisture and its measurements	theoretical +

		measure the moisture level of the soil		practical
6	4	Training the student to know the depth of the root zone to reduce water losses as a result of water leakage to a level deeper than the root zone	Water tip and seepage, soil-to-tip relationship, irrigation water preparation	theoretical + practical
7	4	Training the student to know the depth of the root zone to reduce water losses as a result of water leakage to a level deeper than the root zone	Water tip and seepage, soil-to-tip relationship, irrigation water preparation	theoretical + practical
8	4	Training the student to calculate the water consumption of plants	Water consumption and its measurement methods	theoretical + practical

9	4	Training the student to calculate the water consumption of plants	Water consumption and its measurement methods	theoretical + practical
10	4	Teaching the student how to economize on the use of irrigation water by using intermittent irrigation in addition to calculating the irrigation efficiency	Water meter Calculation of irrigation depth, determination of the number and periods of irrigation, irrigation efficiency	theoretical + practical
11	4	Teaching the student how to economize on the use of irrigation water by using intermittent irrigation in addition to calculating the irrigation efficiency	Water meter Calculation of irrigation depth, determination of the number and periods of irrigation, irrigation efficiency	theoretical + practical

12	4	Introduce the student to how to calculate the cross-section of the watercourse in order to calculate the channel drainage through positional equations	Calculation of the sections for open channels and drains using equations (Mannick, Cheesy, Darcy, optimum hydraulic section)	theoretical + practical	
13	4	Introduce the student to how to calculate the cross-section of the watercourse in order to calculate the channel drainage through positional equations	Calculation of the sections for open channels and drains using equations (Mannick, Cheesy, Darcy, optimum hydraulic section)	theoretical + practical	
14	4	Introducing the student to how to design irrigation and drainage networks by	Field surveys for irrigation and drainage projects, general planning of irrigation and drainage networks	theoretical + practical	

		conducting a field survey of the terrain			
15	4	Introducing the student to how to design irrigation and drainage networks by conducting a field survey of the terrain	Field surveys for irrigation and drainage projects, general planning of irrigation and drainage networks	theoretical + practical	

11. Infrastructure	
1- Required prescribed books	<p>1. Irrigation: its basics and applications / d. Nabil Ibrahim Al-Taif, College of Agriculture, Department of Soil Sciences - University of Baghdad, and Issam Khudhair Al-Hadithi, College of Agriculture and Forestry, Department of Soil</p>

	<p>Sciences - University of Mosul,</p> <p>1988</p>
<p>2 -main references (sources)</p>	<p>Theoretical sources</p> <p>1- Irrigation and drainage engineering / Dr. Charles Shukri, College of Engineering - University of Baghdad 1981</p> <p>2- The Basics of Agricultural Irrigation - Dr. O Fathi Ibrahim 1976 New Publications House</p> <p>3- Irrigation Engineering - Dr. Nazih Asaad Younan 1976 - University Book House in Alexandria</p> <p>4- “Irrigation Principles and Practices”, O.W. Israelsen and V. E. Hansen, John Wiley and Sons Inc., 1976.</p> <p>5- “Irrigation Engineering”, Cimmerian, John Wiley sons, Inc 1966.</p> <p>6- Food and Agriculture Organization Publications Collection. (in English)</p> <p>Practical Resources</p>

	1- Water science and applications - Baqir Kashif Al-Ghatta 2- Irrigation Engineering - Nazih Asaad - Alexandria University Library
a- Recommended books and references (scientific journals, reports,)	
b- electronic references, websites...	

12. Course Development Plan
1- Keeping abreast of scientific development in the field of specialization and providing students with everything new. 2- Updating and revising lectures annually. 3- Using modern means in teaching and learning. 4- Use of educational websites and lectures available on the Internet.

13- . Admission plan:

Qualifications: Graduates of the Preparatory Scientific Academy.

Minimum student admission: Irrigation and drainage branch:

60 students:

<https://www.mti.ntu.edu.iq/wp-content/uploads/2021/10/%D8%A7%D9%84%D8%A8%D8%B1%D9%86%D8%A7%D9%85%D8%AC-%D8%A7%D9%84%D8%A7%D9%83%D8%A7%D8%AF%D9%8A%D9%85%D9%8A-%D8%A8%D8%A7%D9%84%D9%84%D8%BA%D8%AA%D9%8A%D9%86-%D8%A7%D9%84%D8%B9%D8%B1%D8%A8%D9%8A-%D9%88%D8%A7%D9%84%D8%A7%D9%86%D9%83%D9%84%D9%8A%D8%B2%D9%8A.pdf>

مصادقة العميدة