وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي
قسم الاعتماد


# Guide to Describing the Academic Program and the Course

**2024**

## Introduction:

The educational program is an organized package of courses that includes procedures and experiences organized in the form of study vocabulary. Its main purpose is to build and refine the skills of graduates, making them qualified to meet the labor market requirements. It is reviewed and evaluated annually through internal and external audit procedures and programs like the external examiner program.

The description of the academic program provides a summary of the program's main features and its courses, showing the skills that students are working on acquiring, based on the goals of the academic program. This description is important because it represents the cornerstone in obtaining program accreditation, and the teaching staff participates in writing it under the supervision of scientific committees in the scientific departments.

This guide, in its second edition, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the developments in the educational system in Iraq, which included a description of the academic program in its traditional form (annual, semester), as well as adopting a generalized description of the academic program according to the Department of Studies' book No. 3/2906 dated May 3, 2023, regarding programs that rely on the Bologna path as a basis for their work.

In this regard, we cannot but emphasize the importance of writing a description of academic programs and courses to ensure the smooth running of the educational process.

**Concepts and Terms:**

**Description of the academic program:** It provides a concise summary of its vision, mission, and goals, including an accurate description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** It provides a concise summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture of the future of the academic program to be a developed, inspiring, motivating, realistic, and applicable program.

**Program Message:** It briefly explains the goals and activities necessary to achieve them, and defines the program's development paths and directions.

**Program Goals:** These phrases describe what the academic program intends to achieve within a specified period and are measurable and observable.

**Curriculum Structure:** All courses/subjects included in the academic program according to the adopted learning system (semester, annual, Bologna path), whether they are required (ministry, university, college, and scientific department) with the number of study units.

**Learning Outcomes:** A compatible set of knowledge, skills, and values that the student acquired after completing the academic program, and the learning outcomes for each course must be determined in a way that achieves the program's goals.

**Teaching and Learning Strategies:** These are the strategies used by the faculty member to develop student teaching and learning, and they are plans that are followed to reach learning goals. That is, it describes all classroom and extracurricular activities to achieve the learning outcomes of the program.

**Academic Program Description Template**

**University Name:** Northern Technical University

**College/Institute:** College of Agricultural Technology / Mosul

**Scientific Department:** Department of Desertification Control Techniques

**Name of the academic or professional program:** Bachelor of Technical Desertification Control

**Final Certificate Name:** Bachelor of Technical Desertification Control

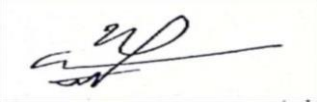
**Educational System:** Courses

**Description Preparation Date:** January 8, 2024

**File Completion Date:** January 8, 2024

Signature : 

Head of Department : Dr. Faris Faisal Abdulghani

Signature : 

Assit. Lec. Mahmood Shaker Mahmood
Dean's Assistant for Scientific Affairs

Date : 8/01/2024

**File Checked by:**

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Name of the Director of the Quality Assurance and University Performance Division:
Assit. Lec. Haneen Mowfak Ahmeed
Date: : 8/01/2024
Signature: 


**Approval of the Dean**

Prof. Dr. Shihab Ahmed Yossuf

| 1. Program vision .1 |
| --- |
| Establishing a department that will serve as an influential scientific, cultural and intellectual center that nourishes the Iraqi society in particular and the Arab society in general with efficient technical outputs that meet their needs in quantity and quality. Equipped with high-quality educational supplies<br><br>(Model laboratories for training students, the Internet, smart boards, specialized technical staff with advanced degrees who possess scientific skills in the field of specialization...etc.) It adopts the open and distance education system. |

| Program message |
| --- |
| Preparing immediate administrative technical cadres for materials management, an expert in academic skills and skills that qualify them to set goals and targets for action, working with high efficiency and serving as a link between other managers, translating organizational goals and thinking |
| Program objectives .2 |
| **Preparing qualified technical cadres to workIn the field of clinical and pharmaceutical pharmacy under the supervision of a pharmacist andIn the field of pharmaceutical and chemicalIndustries under the supervision of a pharmacist or chemist, whether in state departments or the private sector.** |

| **Program accreditation** .3 |
| --- |
| Nsomething |

| **Other external influences** .4 |
| --- |

| 5-Program structure | | | | |
|---|---|---|---|---|
| Percentage | Percentage | Study unit | Number of courses | Program structure |
| 8Basic course2 optional | 16.8 | 18 | 10 | Enterprise requirements |
| 21Basic course4 optional | 70.1 | 75 | 25 | Department requirements |
| essential | | | Nothing | Summer training |
| | | | | Other |

**Notes may include whether the course is basic or optional.**

## Department of Desertification Control Techniques – Level1Courses

| The symbol | The pavement if any | Number of units | Number of hours | | Course name | | Requirement Type |
|---|---|---|---|---|---|---|---|
| | | | practical | theoretical | In English | In Arabic | |
| | - | 2 | 0 | 2 | | Computer | University |
| TAMO202 | - | 2 | 0 | 2 | | Agricultural statistics | |
| DES156 | - | 2 | 1 | 1 | | Soil management | |
| NTU104 | - | 2 | 0 | 2 | | Arabic | |
| | - | 2 | 1 | 1 | | Desert land management | |
| DES203 | - | 2 | 0 | 2 | | Water management | |
| | | 10 | | | | | |
| DES303 | . | 4 | 2 | 2 | | Land reclamation | to divide |
| DES357 | . | 4 | 2 | 2 | | Water reuse | |
| DES202 | . | 4 | 2 | 2 | | remote sensing | |
| DES201 | . | 4 | 2 | 2 | | Dry farming | |
| | . | 4 | 2 | 2 | Organic Chemistr | chemistrymembership | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | y | | |
| | . | 4 | 2 | 2 | | Analytical Chemistry | |
| DES251 | . | 2 | - | 2 | | gardening | |
| DES155 | . | 2 | - | 2 | | geologic | |
| DES205 | . | 4 | 2 | 2 | | Geomorphology | |
| | | 30 | | | Total required department requirements units | | |
| | | 52 | | | Total units of the first level | | |

| The symbol | The pavement if any | Number of units | Number of hours | | Course name | | Requirement Type |
|---|---|---|---|---|---|---|---|
| | | | practical | theoretical | In English | | |
| DES352 | - | 2 | 0 | 2 | | Conditioned agriculture | University |
| DES101 | - | 2 | 0 | 2 | | Field irrigation methods | |
| DES304 | - | 2 | 1 | 1 | | Wind erosion prediction models | |
| DES154 | - | 2 | 0 | 2 | | Field crops | |
| DES453 | - | 2 | 1 | 1 | | Geographic Information Systems | |
| DES451 | - | 2 | 0 | 2 | | Dry area facilities | |
| | | 10 | | | | | |
| DES204 | . | 4 | 2 | 2 | | Fertility and fertilization | to divide |
| DES453 | . | 4 | 2 | 2 | | Dryland pastures | |
| DES353 | . | 4 | 2 | 2 | | dryland communities | |
| DES102 | . | 4 | 2 | 2 | | Field crop modeling | |
| DES152 | . | 4 | 2 | 2 | | Animal production principles | |
| DES206 | . | 4 | 2 | 2 | | Fruit production in desert areas | |
| | . | 2 | - | 2 | | | |
| | . | 2 | - | 2 | | | |
| | . | 4 | 2 | 2 | | | |
| | | 30 | | | Total required department requirements units | | |
| | | 52 | | | Total units of the first level | | |

| Program Description .5 | | | | |
|---|---|---|---|---|
| **Credit hours** | | **Course name** | **Course code** | **Year/Level** |
| Practical | **theoretical** | | | |
| **20** | **32** | **Desertification control techniques level first** | | 2023-2024 /the first |
| **25** | **30** | **Desertification control techniques level 2** | | 2023-2024 /the second |

| 1.Expected learning outcomes of the program .6 | |
|---|---|
| **Knowledge** | |
| A- Cognitive objectives<br>1.Raising awareness: Disseminating knowledge about the causes of desertification and its effects on the environment and local communities.<br>2.Developing research: Conducting scientific studies and research to understand the phenomena associated with desertification and identify the factors affecting it.<br>3.Knowledge exchange: Enhancing cooperation between academic and research institutions to exchange knowledge and expertise in the field of combating desertification.<br>4.Developing strategies: Developing effective strategies to combat desertification, including sustainable agricultural techniques and rehabilitation of degraded lands.<br>5.Training and awareness: Organizing workshops and training courses to raise the efficiency of individuals and communities in confronting desertification.<br>6.Impact evaluation: Studying and evaluating the impact of policies and programs in place to combat desertification and providing the necessary recommendations. | Cognitive objectives |
| **Skills** | |
| 1.Data Analysis: Develop skills in analyzing environmental and climate data to understand desertification patterns and identify influencing factors.<br>2.Land Assessment: Gain skills in assessing the condition of degraded lands and applying appropriate rehabilitation techniques.<br>3.Environmental Planning: Enhance planning and organizing skills to develop effective strategies to combat desertification.<br>4.Technology Application: Learn to use modern technologies such as Geographic Information Systems (GIS) and Remote Sensing in monitoring land and desertification.<br>5.Natural Resource Management: Develop skills in managing water and soil resources sustainably to reduce the risks of desertification | Program specific skill objectives |

| Values | |
|---|---|
| | |
| Value goals | 1.Sustainability: Promoting the value of sustainability in the management of natural resources to ensure that the needs of current and future generations are met.<br>2.Environmental Responsibility: Instilling the value of responsibility towards the environment, which encourages individuals and communities to take positive steps to protect the environment.<br>3.Cooperation and Partnership: Encouraging the values of cooperation and partnership between various parties (governments, non-governmental organizations, civil society) to achieve the goals of combating desertification.<br>4.Social Justice: Promoting the value of social justice by ensuring the rights of local communities and securing their access to natural resources. |

| Teaching and learning strategies .7 |
|---|
| Teaching and learning strategies and methods adopted in the program in general |

| Evaluation methods .8 |
|---|
| **The studentls evaluated through evaluation forms, daily assessments, interviews, discussion topics and seminars,In addition to daily, semester and final exams.** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Faculty** .9 | | | | | | |
| **Faculty members** | | | | | | |
| **Faculty preparation** | | **Special requirements /skills (if any)** | | **specialization** | | **Academic rank** |
| **lecturer** | **staff** | | | **private** | **general** | |
| | staff | | | Horticulture and landscaping | Horticulture and landscaping | Lecturer 2 |
| | staff | | | Horticulture and landscaping | Horticulture and landscaping | Lecturer |
| | staff | | | Horticulture and landscaping | Horticulture and landscaping | Ass. Lecturer |
| | staff | | | Forestry | Forestry | Ass. Lecturer |
| | staff | | | Soil and water resources | Soil and water resources | 2 Ass. Lecturer |
| | staff | | | Computer | Computer | Ass. Lecturer |
| | staff | | | Arabic Language | Arabic Language | Ass. Lecturer |
| | staff | | | Plant protection | Plant protection | Ass. Lecturer |

| |
|---|
| **Professional development** |

| Orientation of new faculty members |
| --- |
| New members of the department are developed through their introduction to teaching methods courses, and they are given a teaching eligibility test, as well as holding a training course, seminars and workshops to train them on the approved work contexts. |
| **Professional development for faculty members** |
| 1. Scientific trips or scientific visits. 5. Recreational trips.<br>2. Educational meetings. 6. Sports activity.<br>3. Assigning him to give lectures. 7. Attending scientific debates.<br>4. Attending seminars. Recreational trips. |

| **Acceptance Criteria** .10 |
| --- |
| **The admission standard is through central admission within the ministry's plan and according to the student's branch.In middle schoolHis average and desire, and this is done after conducting a special interview for the student at the institute.** |

| **The most important sources of information about the program** |
| --- |
| **The curriculum book, auxiliary notebooks, external sources (Internet), scientific research and its latest developments.** |

| Program development plan .11 |
| --- |
| Future plans include developing a laboratory.AT Technology SectionCombating desertificationAs well as development on the d approachverticalBy deletionAnd the addition And replacement |

## Course Description

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **1. Educational institution** |
| Agricultural Technical CollegeTechnology DepartmentCombating desertification | **2. the university/Scientific Department** |
| Soil Management DES156 | **3. name/Course code** |
| | **4. The program(s) that youincomeIn itA** |
| 1- Weekly class schedule(theoretical).<br>2- Discussions, scientific seminars and other extracurricular activities | **5. Available attendance forms** |
| Decisions. | **6. the chapter/Year** |
| 30 | **7. Number of study hours(Total)** |
| **8/1/2024.** | **8. Date this description was prepared** |

9. Course objectives

1- Get to knowTypessoil
2- Study of soil information
3- studyTypesSoil, suitable crops and their relationship to the ecosystem

10. Course outcomes, teaching, learning and assessment methods

1- Students will be able to identify the types of soil.
2- Students will learn how to deal with different types of soil.
3- It will enable students to know the distribution of crops according to the type of suitable soil.

**B - Course specific skill objectives.**

1- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
2- Ability to communicate and inquire with the subject teacher
**3-** Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on related topics.soil environment

**Teaching and learning methods**

| |
|---|
| **((Theoretical lectures / interactive lectures /)).** |
| **Evaluation methods** |
| **((Oral exams / written exams / weekly reports / daily attendance / participation and interaction in lectures / semester and final exams))** |
| **C- Emotional and value-based goals**<br>Performing his duties at work sites for professional reasons |
| **Teaching and learning methods** |
| **((Theoretical lectures / discussion groups / debates between students))** |
| **Evaluation methods** |
| **((Oral tests / written tests / observation / student's cumulative record))** |
| **D - General and transferable skills (other skills related to employability and personal development).**<br>• It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.<br>• It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.<br>• That is, it causes a change in the learner's behavior. |

| Course structure | | | | | |
|---|---|---|---|---|---|
| Evaluation method | Teaching method | Unit name/Or the subject | Required learning outcomes | Watches | The week |
| Tests and reports | theoretical | Course introduction, learning objectives, course content | Knowledge and application | 2 | 1 |
| Tests and reports | theoretical | **What is soil, the purpose of its study, soil science, its branches, the basic components of soil.** | Knowledge and application | 2 | 2 |
| Tests and reports | theoretical | **Weathering, its types, factors, and the composition of the parent material.**<br>**Soil formation and development, soil formation factors.**<br>**Soil morphology, soil texture, soil horizons, soil color, other morphological characteristics.**<br>**Physical properties of soil and their relationship to plant growth.** | Knowledge and application | 2 | 3 |
| Tests and reports | theoretical | **Physical properties of soil and their relationship to plant growth.** | Knowledge and application | 2 | 4 |
| Tests and reports | theoretical | **Physical properties of soil and their relationship to plant growth.**<br>**What is soil, the purpose of its study, soil science, its branches, the basic components of soil.** | Knowledge and application | 2 | 5 |
| Tests and reports | theoretical | **Physical properties of soil and their relationship to plant growth.** | Knowledge and application | 2 | 6 |
| Tests and reports | theoretical | **Liquid phase of soil, soil-water relationship, water constants, soil water classification.** | Knowledge and application | 2 | 7 |

| | | | | | |
|---|---|---|---|---|---|
| Tests and reports | theoretical | **Soil colloids, clay minerals.**<br>**Chemical properties of soil, soil reaction, ion exchange, cation exchange capacity.**<br>**Organic matter in soil, its sources, importance, components, and decomposition.**<br>**Soil salinity, sources of salinity, causes of salinity, classification of saline soils, reclamation of saline soil, salinity inspection, etc.**<br>**Soil fertility, major and minor nutrients, their importance, sources, and symptoms of deficiency.** | Knowledge and application | 2 | 8 |
| Tests and reports | theoretical | **The relationship between soil, water and plants.**<br>**Soil classification**Right of ownership | Knowledge and application | 2 | 9 |
| | | Monthly exam | Knowledge and application | 2 | 10 |
| Tests and reports | theoretical | **Soil colloids, clay minerals.** | Knowledge and application | 2 | 11 |
| Tests and reports | theoretical | **Chemical properties of soil, soil reaction, ion exchange, cation exchange capacity.** | Knowledge and application | 2 | 12 |
| Tests and reports | theoretical | | Knowledge and application | 2 | 13 |
| Tests and reports | theoretical | **Organic matter in soil, its sources, importance, components, and decomposition.**<br>**Soil salinity, sources of salinity, causes of salinity, classification of saline soils, reclamation of saline soil, salinity inspection, etc.** | Knowledge and application | 2 | 14 |
| Tests and | theor | **Soil fertility, major and minor nutrients, their** | Knowledge and | 2 | 15 |

| | | | | | |
|---|---|---|---|---|---|
| reports | etical | **importance, sources, and symptoms of deficiency.** | application | | |

| Infrastructure | |
|---|---|
| Available in free education and the institute's library | **Required Textbooks** |
| Available in free education and the institute's library | **Main References (Sources)** |
| Internet | **Electronic references, websites** |

| Curriculum Development Plan |
|---|
| 1- Developing appropriate curriculaDevelopments in soil science.<br>2- Divide the material into two partsthe firstOne is related to soil science and the other is related to soil interactions. |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **11. Educational institution** |
| Agricultural Technical College Mosul/Technology DepartmentCombating desertification | **12. the university/Scientific Department** |
| Agricultural statistics**TAMO202** | **13. name/Course code** |
| | **14. The program(s) that youincomeIn itA** |
| 3- Weekly class schedule(theoretical).<br>4- Discussions, scientific seminars and other extracurricular activities | **15. Available attendance forms** |
| Decisions. | **16. the chapter/Year** |
| 30 | **17. Number of study hours(Total)** |
| **8/1/2024.** | **18. Date this description was prepared** |

19. Course objectives

1- What the student studies should be consistent with his inclinations and thinking trends.

2- The student should feel the importance of correcting refractive errors in the eye.

3- The student should listen carefully to the teacher's explanation.

4- That the student feels what cognitive distinction and excellence mean.

5- The student should learn about the impact of science and scientists.

6-The student should respect time and class rules.

20. Course outcomes, teaching, learning and assessment methods

1. Introducing the student to the importance of statistics and its relationship to other sciences
2. Describe, analyze and extract data
3. Studying the relationship of the phenomenon to other phenomena and estimating the value of the phenomenon in the future

**24-Course specific skill objectives.**

1. Ability to use different graphic formats to display data for any phenomenonRAnd
2. Ability to use statistical methods to analyze data
3. The ability to make an appropriate decision about the problem under study after reaching the results that have been analyzed.

| |
|---|
| |
| 25-Teaching and learning methods<br>**((Theoretical lectures / listening lectures / conversation lectures / interactive lectures / searching in libraries and the Internet for specific topics)).** |
| **Evaluation methods**<br>**((Oral exams / written exams / weekly reports / daily attendance / participation and interaction in lectures / semester and final exams))** |
| **C- Emotional and value-based goals**<br>**Develop students' skills to use and practiceAgricultural statistics.** |
| **Teaching and learning methods** |
| **((Theoretical lectures / discussion groups / debates between students / preparing reports in English))** |
| **Evaluation methods** |
| **((Oral tests / written tests / observation / student's cumulative record))** |
| **D - General and transferable skills (other skills related to employability and personal development).**<br>**D1-Improve skillsStudentsIn statistics and arithmetic operations**<br>**D2-Raising research awarenessFor students in writing reports, research and university theses.** |

| Course structure | | | | | |
|---|---|---|---|---|---|
| Evaluation method | Teaching method | Unit name/Or the subject | Required learning outcomes | Watches | The week |
| Tests and discussion | theoretical | Learn about the agricultural statistics course | Knowledge and application | 2 | 1 |
| Tests and reports | theoretical | Definition of statistics, its importance, historical overview, division of statistics, statistical symbols, nature of data | Knowledge and application | 2 | 2 |
| Tests and discussion | theoretical | Presentation, table, graph, statistical data, grouped data, ungrouped data, frequency, categories | Knowledge and application | 2 | 3 |
| Tests and reports | theoretical | Presentation, table, graph, statistical data, grouped data, ungrouped data, frequency, categories | Knowledge and application | 2 | 4 |
| Tests and discussion | theoretical | Presentation, table, graph, statistical data, grouped data, ungrouped data, frequency, categories | Knowledge and application | 2 | 5 |
| Tests and reports | theoretical | Measures of centralization in both grouped and ungrouped data | Knowledge and application | 2 | 6 |
| Tests and discussion | theoretical | Measures of centralization in both grouped and ungrouped data | Knowledge and application | 2 | 7 |
| Tests and reports | theoretical | Link<br>Link<br>Slope<br>Slope<br>probability, probability distributions | Knowledge and application | 2 | 8 |
| Tests and | theoretical | probability, probability | Knowledge and | 2 | 9 |

| | | | | | |
|---|---|---|---|---|---|
| discussion | | distributions<br>Link | application | | |
| Tests and reports | theoretical | Link<br>Slope | Knowledge and application | 2 | 10 |
| Tests and discussion | theoretical | | Knowledge and application | 2 | 11 |
| Tests and reports | theoretical | Slope<br>probability, probability distributions | Knowledge and application | 2 | 12 |
| Tests and discussion | theoretical | | Knowledge and application | 2 | 13 |
| Tests and reports | theoretical | probability, probability distributions | Knowledge and application | 2 | 14 |
| Discussion | theoretical | | Knowledge and application | 2 | 15 |

| Infrastructure | |
|---|---|
| Available in free education and the institute's library | **Required Textbooks** |
| Available in free education and the institute's library | **Main References (Sources)** |
| **Internet** | **Electronic references, websites** |

| **Curriculum Development Plan** |
|---|
| 1- Developing appropriate curriculaFor university graduates |
| 2- Holding seminars and conferences aimed at updating curricula |

# Course Description

| | |
|---|---|
| Ministry of Higher Education and Scientific Research / Northern Technical University | **21. Educational institution** |
| Agricultural Technical CollegeMosul / Technology DepartmentCombating desertification | **22. University/Scientific Department** |
| Computer | **23. Course Name/Code** |
| Technical DiplomaMedical laboratories(According to the outputs of each department) | **24. The program(s) you are involved in** |
| 5- Weekly lesson schedule (theoretical)And my work).<br>6- Discussions, scientific seminars and other extracurricular activities | **25. Available attendance forms** |
| Decisions. | **26. Chapter/Year** |
| 30 | **27. Number of study hours (total)** |
| **8/1/2024**. | **28. Date this description was prepared** |

29. Course objectives

1- Teaching the student computer skills, using its ready-made applications, and Internet principles in the field of specialization.

2- Teaching the student computer skills, using its ready-made applications, and Internet principles in the field of specialization.

3- Performing his duties at the workplace with professional motives.

30. Course outcomes, teaching, learning and assessment methods

أ- **Cognitive objectives**

**Teaching the student computer skills, using its ready-made applications, and Internet principles in the field of specialization.**

**B - Course specific skill objectives.**

**Teaching the student computer skills, using its ready-made applications, and Internet principles in the field of specialization.**

**Teaching and learning methods**

**((Theoretical lectures / practical lectures / field visits / solving examples / discussion groups / summer training))**

**Evaluation methods**

**((Oral exams / written exams / weekly reports / daily attendance / semester and final exams))**

**C- Emotional and value-based goals**

| |
|---|
| **Performing his duties at the workplace with professional motives.** |
| **Teaching and learning methods**<br>**((Theoretical lectures / practical lectures / field visits / solving examples / discussion groups / summer training))** |
| **Evaluation methods**<br>**((Oral tests / written tests / observation / student's cumulative record))** |
| **D - General and transferable skills (other skills related to employability and personal development).**<br>**D1- Improving their discussion skills.**<br>**D2- Raising their research awareness and moving the student from the teaching stage to learning.** |

| Infrastructure | |
|---|---|
| Available in the free section and the institute library | Required Textbooks |
| Available in the free section and the institute library | Main References (Sources) |
| Internet | Electronic references, websites |

| **Curriculum Development Plan** |
|---|
| 1- Develop curricula that are appropriate for the labor market |
| 2- Holding scientific seminars and conferences aimed at updating curricula |
| 3- Follow up on scientific developments in the field of specialization |

| Course structure | | | | | |
|---|---|---|---|---|---|
| Evaluation method | Teaching method | Unit name/Or the subject | Required learning outcomes | Watches | The week |
| Tests and discussion | **Practical + theoretical** | **Introduction to computer / computer system / information technology / types of computers / input units / central processing unit / output units / main memory and its types / data storage in memory / factors affecting computer performance**<br>**Definition of software and its types / Systems software: operating systems / Programming languages and programming systems / Application software.** | **Knowledge and practical application** | 2 | **1&2** |
| Tests and reports | **Practical + theoretical** | **Introduction aboutWindows / Its features / Turning on the device / Shutting down the device / Using the mouse / Windows screen components: Taskbar: Icons: and their types (standard and general).** | **Knowledge and practical application** | 2 | **3** |
| Tests and discussion | **Practical + theoretical** | **Control Panel / Desktop Control / Screen Saver / Window Colors and Fonts / Display Settings / Adjust Screen Colors / Adjust Time and Date / Volume / Change Mouse Buttons / Control Double-Click Speed / Change Mouse Pointer / Control Mouse Speed / Install and Uninstall Programs** | **Knowledge and practical application** | 2 | **4** |
| Tests and reports | **Practical + theoretical** | **Minimize and maximize the window / close it permanently / close it temporarily / move the window / control the window size / methods of running applications and programs** | **Knowledge and practical application** | 2 | **5** |
| Tests and discussion | **Practical + theoretical** | **Sort list itemsstart / delete start menu items / add submenu to start menus / add new button to start menu** | **Knowledge and practical application** | 2 | **6** |
| Tests and reports | **Practical + theoretical** | **Basic System Information / Stop Unwanted Applications**<br>**windows explorerWindows Explorer / My Computer Icon / My Computer Window Parts** | **Knowledge and practical application** | 2 | **7** |
| Tests and discussion | **Practical + theoretical** | **Recycle Bin (delete, restore and empty the recycle bin) / iconmy document** | **Knowledge and practical application** | 2 | **8&9** |
| Tests and | **Practical +** | **Define files and folders / Select files and folders / Properties of files and folders /** | **Knowledge and practical** | 2 | **10&11** |

| | | | | | |
|---|---|---|---|---|---|
| reports | **theoretical** | **Create files and folders / Change the name of files and folders / Move a file or folder / Copy a file or folder / Search for a file or folder / Create a shortcut icon for an application or file** | **application** | | |
| Tests and discussion | **Practical + theoretical** | **Calculator / Notebook / Notebook / Use the notebook to edit and create the file**<br>**Painter / Screen components / Creating graphics / Determining foreground and background colors / Choosing brush stroke size / Determining and selecting the drawing tool / Saving the drawing / Making the drawing the desktop background / Finishing the painter Entertainment programsMedia player** | **Knowledge and practical application** | 2 | **12&13** |
| Tests and reports | **Practical + theoretical** | **Viruses / Reason for the name / Definition / Ways of spreading the virus / Symptoms of infection with the virus / Methods of protection / Types of viruses**<br>**Computer crimes / theft / hackers** | **Knowledge and practical application** | 2 | **14&15** |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **31. Educational institution** |
| Agricultural Technical College Mosul/Technology DepartmentCombating desertification | **32. the university/Scientific Department** |
| Arabic**NTU104** | **33. name/Course code** |
| | **34. The program(s) that youincomeIn itA** |
| 7- Weekly class schedule(theoretical).<br>8- Discussionsand reports | **35. Available attendance forms** |
| Decisions. | **36. the chapter/Year** |
| 30 | **37. Number of study hours(Total)** |
| //**2024**. | **38. Date this description was prepared** |
| 39. Course objectives | |

1- Enabling the student to read correctly.

2- Enabling the student to write correctly and use punctuation marks well.

3- That the student acquires the ability to use the Arabic language correctly.

4- Introducing the student to the correct Arabic words, structures and styles in an interesting way.

5- Accustoming the student to expressing his ideas clearly and correctly.

6- Helping the student understand complex structures and obscure styles.

40. Course outcomes, teaching, learning and assessment methods

1. **Cognitive objectives**

A- The student should be familiar with the common mistakes in writing the Arabic language in order to avoid them.

ب- The student should learn about punctuation marks and use them correctly.

ج- The student should be able to distinguish between the solar and lunar lam, which will help him pronounce them correctly.

د- The student should be able to differentiate between the letters “Ḍād” and “Ḍā’,” which will help him avoid making spelling mistakes.

ه- To distinguish between verbs, nouns and particles, this is what his Arabic speech is based on.

و- To be able to write the hamza in its correct position correctly.

**B - Course specific skill objectives.**

B1 -Providing the student with a linguistic wealth that makes him more able to express what he wants correctly.

B2- Correcting the student’s tongue and protecting him from mistakes

**Teaching and learning methods**

**((Theoretical lectures / listening lectures / conversation lectures / interactive lectures / searching in libraries and the Internet for specific topics)).**

**Evaluation methods**

**((Oral exams / written exams / weekly reports / daily attendance / participation and interaction in lectures / semester and final exams))**

**C- Emotional and value-based goals**

| |
|---|
| A1- Developing, activating and organizing thinking<br><br>A2-Working to make the student's imagination fertile by highlighting the beauty of the language and thus enabling him to express the inner feelings of the soul in a sound manner. |
| **Teaching and learning methods** |
| **((Theoretical lectures / discussion groups / student debates / preparing reports))** |
| **Evaluation methods** |
| **((Oral tests / written tests / observation / student's cumulative record))** |
| **D - General and transferable skills (other skills related to employability and personal development).**<br><br>D1-The ability to develop and enhance his expressive skills such as poetry and storytelling.<br><br>D2- The ability to communicate with the outside world correctly. |

| Course structure | | | | | |
|---|---|---|---|---|---|
| Evaluation method | Teaching method | Unit name/Or the subject | Required learning outcomes | Watches | The week |
| a testverbal | Discussion method, lecture method | Introduction to Grammatical Errors-The closed taa and the open taa | 1. Identifying types of linguistic errors.<br>2. Differentiating between open and closed taa | 2 | 1 |
| a testverbal | Discussion method, lecture method | Rules for writing the extended and shortened alif - solar and lunar letters | 1. Differentiating between writing the extended alif and the short alif and the places where the two alifs are written<br>2. Differentiating between solar and lunar letters | 2 | 2 |
| a testverbal | Discussion method, lecture method | Dad and Tha | Differentiate betweenDad and Tha | 2 | 3 |
| a testverbal | Discussion method, lecture method | Writing the hamza | Enabling the student toWriting the hamzaCorrect writing | 2 | 4 |
| a testverbal | Discussion method, lecture method | punctuation marks | Get to knowpunctuation marksAnd write it in the right place | 2 | 5 |
| a testverb | Discussion method, lecture | Noun, verb and the difference between | 1. Identify the noun and verb and state the | 2 | 6 |

| | | | | | |
|---|---|---|---|---|---|
| al | method | them | sign of each.<br>2. Differentiating between noun and verb<br>3. Explain the types of verbs<br>4. Differentiating between types of verbs | | |
| a testverbal | Discussion method, lecture method | Effects | Identifying the types of effects and differentiating between them | 2 | 7 |
| a testverbal | Discussion method, lecture method | number | Enable the student to write numbers correctly | 2 | 8 |
| a testverbal | Discussion method, lecture method | Common Language Mistakes Applications | Get to knowCommon language mistakesAnd avoid it | 2 | 9 |
| a testverbal | Discussion method, lecture method | Common Language Mistakes Applications | Get to knowCommon language mistakesAnd avoid it | 2 | 10 |
| a testverbal | Discussion method, lecture method | Noon and Tanween - Meanings of Prepositions | 1. Differentiating between Noon and Tanween<br>2. Identify the meanings of prepositions. | 2 | 11 |
| a testverbal | Discussion method, lecture | Formal aspects of administrative discourse | Get to knowFormal aspects of administrative | 2 | 12 |

| | | | | | |
|---|---|---|---|---|---|
| | method | | discourse | | |
| a testverbal | Discussion method, lecture method | Administrative discourse language | Getting to know the language of administrative discourse | 2 | 13 |
| a testverbal | Discussion method, lecture method | Administrative discourse language | Getting to know the language of administrative discourse | 2 | 14 |
| a testverbal | Discussion method, lecture method | Administrative correspondence samples | Get to knowAdministrative correspondence samples | 2 | 15 |

| 41. Infrastructure | |
|---|---|
| Required books:<br><br>General Arabic Language Book for Technical Universities(Dr. Safaa Kazim MakkiandDr. Lama Mohammed Younis | 1- Required textbooks |
| 1- Clear Dictation: Abdul Majeed Al-Naimi, Daham Al-Kayyal, Dar Al-Mutanabbi Library, Baghdad, 6th edition, 1987 AD.<br>2- Lessons in language, grammar and spelling for state employees: Ismail Hamoud Atwan and others, Ministry of Education Press No. (3), Baghdad, 2nd ed., 1984 AD.<br>3- Arabic Language for the Third Intermediate Grade: Fatima Nazim Al-Attabi, and others, 1st ed., 2018 AD.<br>4- General Arabic for non-specialization departments: Abdul Qader Hassan Amin and others, Ministry of Higher Education and Scientific Research, 2nd ed., 2000 AD.<br>5- Inspired by Arabic Literature: Hafal Muhammad Amin, Al-Saadoun Press, Baghdad. | 2- Main references (sources) |
| | 3- Electronic references, websites... |

## 42. Curriculum Development Plan

Χορρεχτινγ λινγυιστιχ ερρορσ τηατ οχχυρρεδ ιν τηε ωορκβοοκ το βε ταυγητ ανδ τρψινγ το αδδ α δεφινιτιον το σομε οφ τηε τερμσ ινχλυδεδ ιν τηε ωορκβοοκ, εσπε χιαλλψ σινχε τηε Αραβιχ λανγυαγε ωορκβοοκ ωασ πρεπαρεδ φορ νον–σπεχιαλισ τσ ιν τηε Αραβιχ λανγυαγε, ανδ τηισ λεαδσ το μακινγ τηε πρεσχριβεδ ϖοχαβυλα ρψ μορε πρεχισε ανδ χλεαρ.

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **43. Educational institution** |
| Agricultural Technical College Mosul/Technology DepartmentCombating desertification | **44. the university/Scientific Department** |
| Desert land management | **45. name/Course code** |
| | **46. The program(s) that youincomeIn itA** |
| 9- Weekly class schedule(theoretical+practical).<br>10- Discussions and activitiesSports | **47. Available attendance forms** |
| Decisions. | **48. the chapter/Year** |
| 30 | **49. Number of study hours(Total)** |
| **8/1/2024.** | **50. Date this description was prepared** |

51. Course objectives

أ- Cognitive objectives

- Ability to identify water management elements in arid areas
- Study of plants and their relationship to the ecosystem and climate elements in arid regions
- Learn about the plant succession, climatic regions of Iraq and the types of environment in it.

52. Course outcomes, teaching, learning and assessment methods

أ- **That what the student studies is consistent with his inclinations and thinking trends**

ب- **The student should feel the importance of correcting refractive errors in the eye.**

ت- **The student should listen carefully to the teacher's explanation.**

ث- **The student should feel what cognitive distinction and excellence mean.**

ج- **The student should learn about the impact of science and scientists.**

ح- **The student should respect time and class rules.**

**Teaching and learning methods**

**((Theoretical lectures / practical lectures / field visits / solutionExamples/Discussion sessions))**

**Evaluation methods**

| |
|---|
| **(Oral tests/ written tests/ Reportsweekly/ Daily attendance / Midterm and final exams))** |
| **C- Emotional and value-based goals**<br>1- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.<br>2- Ability to communicate and inquire with the subject teacher<br>Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on topics related to the environment and dry areas.. |
| **Teaching and learning methods** |
| **((Theoretical lectures / practical lectures / field visits / solutionExamples/Discussion sessions))** |
| **Evaluation methods** |
| **((Oral tests / written tests / observation / student's cumulative record))** |
| **D - General and transferable skills (other skills related to employability and personal development).**<br>**D1-Improve their discussion skills.**<br>**D2-Raising their research awareness and moving the student from the stage of education to learning.** |

| Course structure | | | | | |
|---|---|---|---|---|---|
| Evaluation method | Teaching method | Unit name/Or the subject | Required learning outcomes | Watches | The week |
| **Tests and reports** | **theoretical** | Introduction to the desert | **Knowledge and application** | 2 | 1 |
| **Tests and reports** | **theoretical** | dryland management | **Knowledge and application** | 2 | 2 |
| **Tests and reports** | **theoretical** | Water supply | **Knowledge and application** | 2 | 3 |
| **Tests and reports** | **+ Theoretical** | The importance of plants in dry lands | **Knowledge and application** | 2 | 4 |
| **Tests and reports** | **+ Theoretical** | Types of desert plants | **Knowledge and application** | 2 | 5 |
| **Tests and reports** | **+ Theoretical** | Stop sand dunes | **Knowledge and application** | 2 | 6 |

| | | | | | |
|---|---|---|---|---|---|
| **Tests and reports** | **+ Theoretical** | Sandstorm mitigation | **Knowledge and application** | 2 | 7 |
| **Tests and reports** | **theoretical** | - Reducing desert encroachment | **Knowledge and application** | 2 | 8 |
| **Tests and reports** | **theoretical** | Desert tourism | **Knowledge and application** | 2 | 9 |
| **Tests and reports** | **theoretical** | Desert tourism | **Knowledge and application** | 2 | 10 |
| **Tests and reports** | **theoretical** | The economic importance of the desert | **Knowledge and application** | 2 | 11 |
| **Tests and reports** | **theoretical** | The economic importance of the desert | **Knowledge and application** | 2 | 12 |
| **Tests and reports** | **theoretical** | The economic importance of the desert | **Knowledge and application** | 2 | 13 |
| **Tests and reports** | **theoretical** | The possibility of exploiting the desert to establish clean energy production complexes | **Knowledge and application** | 2 | 14 |
| **Tests and reports** | **+ Theoretical** | The possibility of exploiting the desert to establish clean energy production complexes | **Knowledge and application** | 2 | 15 |

| Infrastructure | |
|---|---|
| **Available in the free section and the institute library** | **Required Textbooks** |
| **Available in the free section and the institute** | **Main References (Sources)** |
| Curriculum Development Plan | |
| **1- Develop curricula that are appropriate for the labor market**<br>**Internet**<br>**2- Holding scientific seminars and conferences aimed at updating curricula** | **Electronic references, websites** |
| **3- Follow up on scientific developments in the field of specialization** | |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **53. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **54. the university/Scientific Department** |
| Water managementDES203 | **55. name/Course code** |
| | **56. The program(s) that youincomeIn itA** |
| 11- Weekly class schedule(Theoretical and practical).<br>12- Discussions, scientific seminars and other extracurricular activities | **57. Available attendance forms** |
| Decisions. | **58. the chapter/Year** |
| 60hour (Number of theoretical and practical hours during the 15 weeks) | **59. Number of study hours(Total)** |
| //**2024**. | **60. Date this description was prepared** |

61. Course objectives

1- Learn about the types of water and how to store it

2- Study of information related to water and its properties

3- Study of water suitability for crop irrigation and its relationship to the ecosystem

62. Course outcomes, teaching, learning and assessment methods

1- What the student studies should be consistent with his inclinations and thinking trends.

2- The student should feel the importance of correcting refractive errors in the eye.

3- The student should listen carefully to the teacher's explanation.

4- That the student feels what cognitive distinction and excellence mean.

5- The student should learn about the impact of science and scientists.

**Teaching and learning methods**

Traditional lecture, report writing, seminars, laboratory practical training, hospital-based systematic training, and summer training..

| Evaluation methods |
|---|
| Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions. |

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | Hydrological cycle<br>Hydrological measurements<br>Falling | Knowledge and application | 4 | 1 |
| a test | a lecture | Receiving and storing depression<br>introduction | Knowledge and application | 4 | 2 |
| a test | a lecture, | Hydrological cycle<br>Hydrological measurements | Knowledge and application | 4 | 3 |
| a test | a lecture, | Falling | Knowledge and application | 4 | 4 |
| a test | a lecture, | Receiving and storing depression | Knowledge and application | 4 | 5 |
| a test | a lecture, | evaporation and transpiration | Knowledge and application | 4 | 6 |
| a test | a lecture, | Hydrographs | Knowledge and application | 4 | 7 |
| a test | a lecture, | Groundwater | Knowledge and | 4 | 8 |

| | | | | | |
|---|---|---|---|---|---|
| | | Groundwater (shapes) | application | | |
| a test | a lecture, | leak | Knowledge and application | 4 | 9 |
| a test | a lecture, | Surface water hydrology | Knowledge and application | 4 | 10 |
| a test | a lecture, | | Knowledge and application | 4 | 11 |
| a test | a lecture, | Water flow | Knowledge and application | 4 | 12 |
| a test | a lecture, | | Knowledge and application | 4 | 13 |
| a test | a lecture, | Statistical methods in hydrology | Knowledge and application | 4 | 14 |
| a test | a lecture, | | Knowledge and application | 4 | 15 |

| **63. Curriculum Development Plan** |
|---|
| 1- Review of modern scientific literature<br>2- Participation in relevant scientific conferences<br>3- The teaching and training staff are fully dedicated to application and partial work in hospitals.<br>4- Hosting specialized professors<br>5- Scientific affiliation with other universities and similar colleges |

| **Infrastructure** | |
|---|---|
| A- Recommended books and references(Scientific journals,Reports,....) | 1Required textbooks |
| Electronic references,Websites.... | 2Main references(Sources) |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **64. Educational institution** |
| Agricultural Technical College Mosul/to divideDesertification control techniques | **65. the university/Scientific Department** |
| Land reclamation**DES303** | **66. name/Course code** |
| | **67. The program(s) that youincomeIn itA** |
| 13- Weekly class schedule(Theoretical and practical).<br>14- Discussions, scientific seminars and other extracurricular activities | **68. Available attendance forms** |
| Decisions | **69. the chapter/Year** |
| 60hour | **70. Number of study hours(Total)** |
| //**2024**. | **71. Date this description was prepared** |

72. Course objectives

The characteristics and emergency conditions of the soil that directly and indirectly negatively affect soil productivity and that need reclamation, as well as teaching students how to carry out reclamation operations and improve soils and conduct experiments and practices in this field.

73. Course outcomes, teaching, learning and assessment methods

ب- Cognitive objectives

- Ability to identify water management elements in arid areas
- Study of plants and their relationship to the ecosystem and climate elements in arid regions
- Learn about the plant succession, climatic regions of Iraq and the types of environment in it.

for-**Skill objectives:**

1- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
2- Ability to communicate and inquire with the subject teacher

Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on topics related to the environment and dry areas.

**C- Emotional and value-based goals.:**

1- What the student studies should be consistent with his inclinations and thinking trends.

2- The student should feel the importance of correcting refractive errors in the eye.

3- The student should listen carefully to the teacher's explanation.

4- That the student feels what cognitive distinction and excellence mean.

5- The student should learn about the impact of science and scientists.

6-The student should respect time and class rules.

D-**General and transferable skills:**

After completing the lesson (lecture), the student will be able to:

- Determines the most important methods of reclamation
- Addresses the causes of land degradation

Develops methods to reduce land degradation

Teaching and learning methods

Traditional lecture, report writing, seminars, laboratory practical training, hospital-based systematic training, and summer training..

Evaluation methods

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Link to current topicIn the previous topic), EvaluationSelf, Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

| Course structure | | | | |
|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Watches** | **The week** |
| a test | Lecture, discussion, video presentation, dummy training, live application | **The concept of land reclamation and its role in agricultural production** | 4 | 1 |
| a test | Lecture, discussion, video presentation | **Reclamation of saline lands** | 4 | 2 |
| a test | Lecture, discussion, video presentation | **Reclamation of saline lands** | 4 | 3 |
| a test | Lecture, discussion, video presentation, display models | **Phytoremediation of salt-affected soils** | 4 | 4 |
| a test | Lecture, discussion, video presentation, display models | **Phytoremediation of salt-affected soils** | 4 | 5 |
| practical control | Lecture, discussion, video | **Reclaimed Land Management** | 4 | 6 |

| | | | | |
|---|---|---|---|---|
| | presentation<br>, display models | | | |
| practical control | Lecture, discussion, video presentation, display models | **Reclaimed Land Management** | 4 | 7 |
| practical control | Lecture, discussion, video presentation, display models | **Sodic land reclamation** | 4 | 8 |
| practical control | Lecture, discussion, video presentation, display models | **Reclamation of Sodic Lands...Continued** | 4 | 9 |
| a test | Lecture, discussion, video presentation, display models | **Gypsum land reclamation** | 4 | 10 |
| a test | Lecture, discussion, video presentation, display models | **Desert land reclamation** | 4 | 11 |
| a test | Lecture, discussion, video presentation, display models | **Sandy land reclamation** | 4 | 12 |

| | | | | |
|---|---|---|---|---|
| a test | Lecture, discussion, video presentation, display models | **Calcareous land reclamation** | 4 | 13 |
| a test | Lecture, discussion, video presentation, display models | **Reclamation of fertile lands** | 4 | 14 |
| a test | Lecture, discussion, video presentation, display models | **Acidic land reclamation** | 4 | 15 |

| **Infrastructure** | |
|---|---|
| Available in free education and the institute's library | 1Required textbooks |
| Available in free education and the institute's library | 2Main references(Sources) |
| **Internet** | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

## . Curriculum Development Plan

1- Review of modern scientific literature
2- Participation in relevant scientific conferences
3- Hosting specialized professors
4- Scientific twinning with similar universities and colleges In the same

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **74. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **75. the university/Scientific Department** |
| **DES357**Water reuse | **76. name/Course code** |
| | **77. The program(s) that youincomeIn itA** |
| 15- Weekly class schedule(theoretical).<br>16- Discussions, scientific seminars and other extracurricular activities | **78. Available attendance forms** |
| Decisions. | **79. the chapter/Year** |
| 30hour (Number of theoretical hours during the 15 weeks) | **80. Number of study hours(Total)** |
| //**2024**. | **81. Date this description was prepared** |

82. Course objectives

**General objective:**

Introducing the student to the concept of recycled water, its types and treatment technology, and the possibility of benefiting from sewage water and its risks.

10. Course outcomes, teaching, learning and assessment methods

ت- Cognitive objectives

- Ability to identify water management elements in arid areas
- Study of plants and their relationship to the ecosystem and climate elements in arid regions
- Learn about the plant succession, climatic regions of Iraq and the types of environment in it.

4- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.

5- Ability to communicate and inquire with the subject teacher

Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on topics related to the environment and dry areas.

**Teaching and learning methods**

Traditional lecture, report writing, conducting seminars, training, and summer

internships.

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

1- What the student studies should be consistent with his inclinations and thinking trends.

2- The student should feel the importance of correcting refractive errors in the eye.

3- The student should listen carefully to the teacher's explanation.

4- That the student feels what cognitive distinction and excellence mean.

5- The student should learn about the impact of science and scientists.

6-The student should respect time and class rules.

**Teaching and learning methods**

Traditional lecture, self-study, feedback, deductive and analytical reasoning questions, systematic training in laboratories, practical training in hospitals, and summer training.

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Inferential and deductive questions.

D-**General and transferable skills(Other skills related to employability and personal developmentS**

After completing the lesson (lecture), the student will be able to:

- Identify water sources
- Treats the causes of water scarcity

| |
|---|
| Establishes methods to prevent dehydration |

| 83. Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| Feedback<br>By directing Questions | Method Discussion | **The concept of recycled water. Sources of water used, surface runoff water, drainage water, high groundwater.** | AAdd learning outcomes | 2 | 1 |
| Feedback<br>By directing Questions | Method Discussion | **Methods used in reusing irrigation water of all kinds** | AAdd learning outcomes | 2 | 2 |
| Feedback<br>By directing Questions | Method Discussion | **Wastewater treatment processes, standards and principles of reuse methods** | AAdd learning outcomes | 2 | 3 |
| Feedback<br>By directing Questions | Method Discussion | **Low cost technology for water reuse** | AAdd learning outcomes | 2 | 4&5 |
| Feedback<br>By directing Questions | Method Discussion | **Wastewater, waste water. Wastewater properties. Components and sources of pollutants in wastewater.** | AAdd learning outcomes | 2 | 6 |
| Feedback<br>By directing Questions | Method Discussion | **Wastewater treatment processes. Methods of water disposal and reuse. Selection of treatment methods.** | AAdd learning outcomes | 2 | 7 |

| | | | | | |
|---|---|---|---|---|---|
| | | **Treatment stages. Oxidation and stabilization lakes.** | | | |
| Feedback By directing Questions | Method Discussion | **Advantages and importance of oxidation lakes. Health considerations. Factors affecting the operation of oxidation lakes.** | AAdd learning outcomes | 2 | 8 |
| Feedback By directing Questions | Method Discussion | **Sludge Reuse of sludge (solid sediment) What is sludge and its types. Its chemical composition. Using sludge as a fertilizer.** | AAdd learning outcomes | 2 | 9 |
| Feedback By directing Questions | Method Discussion | **Risks of using treated wastewater and sludge in irrigation and agriculture: biological risks, toxins and hazards of toxic substances.** | AAdd learning outcomes | 2 | 10&11 |
| Feedback By directing Questions | Method Discussion | **Reusing wastewater in groundwater recharge and agricultural and industrial use.** | AAdd learning outcomes | 2 | 12&13 |
| Feedback By directing Questions | Method Discussion | **Use of triple treatment (filtration, absorption, reverse osmosis) Article Use of wastewater, recycling and its benefits.** | AAdd learning outcomes | 2 | 14 |
| Feedback By directing Questions | Method Discussion | **The concept of recycled water. Sources of water used, surface runoff water, drainage water, high groundwater.** | AAdd learning outcomes | 2 | 15 |

| **Infrastructure** | |
|---|---|
| Soil and reclamation books in the college library | 1Required textbooks |
| Internet | 2Main references(Sources) |
| | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **84. For educational institution** |
| Agricultural Technical CollegeMosul/Technology DepartmentCombating desertification | **85. the university/Scientific Department** |
| remote sensingDES202 | **86. name/Course code** |
| | **87. The program you are in** |
| 17- Weekly class schedule(theoretical)<br>18- Discussions, scientific seminars and other extracurricular activities | **88. Available attendance forms** |
| Decisions. | **89. the chapter/Year** |
| 30hour | **90. Number of study hours (total)** |
| **2024**// | **91. Date this description was prepared** |

- Course objectives
- Get to knowTypesField crops
- Study of information related to field crop cultivation
- Study of field crop cultivation and its relationship to the ecosystem

92.

93. Course outcomes, teaching, learning and assessment methods

**A-Cognitive objectives**

- Students will be able to understand what remote sensing is.
- Students will learn how to use remote sensing.
- It will enable students to know the distribution and area of forests.

**for-Course Skill Objectives**.

1- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
2- Ability to communicate and inquire with the subject teacher

Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on related topics.remote sensing

Teaching and learning methods

Traditional lecture, report writing, conducting seminars Systematic training inThe hall, andUsing technology in modern educationSelf-learning, feedback, deductive and analytical thinking questions, systematic training in laboratories.

| Evaluation methods |
| --- |
| Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Asking analytical and inferential questions. |
| **G-Emotional and value goals**<br>**(Other skills related to employability and personal development).**<br>• It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.<br>• It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.<br>• That is, it causes a change in the learner's behavior. |

| 94. Course structure | | | | | |
|---|---|---|---|---|---|
| Evaluation method | Teaching method | Unit name/Or the subject | Required learning outcomes | Watch es | The week |
| a testverbal | lecture, discussionDrawing on the board, powerpoint | | | 2 | 1 |
| a testverbal | Lecture, discussion, video presentation, and powerpoint | | | 2 | 2 |
| a testverbal | lecture, discussion, presentationPowerPoint, acting in pairs | | | 2 | 3 |
| a testOral and practical | Lecture, discussion, video presentation, and display pictures | | | 2 | 4 |
| practical control And oral | Lecture, discussion, video presentation andphoto | | | 2 | 5 |
| practical control | lecture, discussion,The lectureShow videos | | | 2 | 6 |
| practical control And oral | lecture, discussion, presentationSlides | | | 2 | 7 |

| | | | | | |
|---|---|---|---|---|---|
| practical control | Lecture, discussion, video presentation'And pictures | | | 2 | 8 |
| practical control | Lecture, discussion, video presentationAnd pictures | | | 2 | 9 |
| practical control | Lecture, discussion, video presentationAnd pictures | | | 2 | 10 |
| practical control | Lecture, discussion, video presentation andphoto | | | 2 | 11 |
| practical control | Lecture, discussion, video presentationAnd pictures | | | 2 | 12 |
| practical control | Lecture, discussion, video presentationAnd pictures | | | 2 | 13 |
| practical control | Lecture, discussion, video presentationphoto | | | 2 | 14 |
| practical control And oral | Lecture, discussion, video presentation andphoto | | | 2 | 15 |

| Infrastructure | |
|---|---|
| | 1Required textbooks |
| | 2Main references(Sources) |
| | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

## 95. Curriculum Development Plan

1- Review of modern scientific literature.
2- Participation in relevant scientific conferences.
3- The teaching and training staff are free to apply and work in places To apply funeral Learn it.
4- Hosting specialized professors.
5- Scientific affiliation with other universities and similar colleges.

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **96. Educational institution** |
| Agricultural Technical CollegeMosul/Technology DepartmentPlant production | **97. the university/Scientific Department** |
| Dry farmingDES201 | **98. name/Course code** |
| | **99. The program(s) that youincomeIn itA** |
| 19- tableWeekly theory lectures<br>20- Practical lab<br>21- Workshops, seminars and dialogues | **100. Available attendance forms** |
| Decisions. | **101. the chapter/Year** |
| 60hour | **102. Number of study hours(Total)** |
| **8/4/2024**. | **103. Date this description was prepared** |

104. Course objectives

1- Get to knowMethodsDry farming
2- Study of information related to the cultivation of crops suitable for dry farming
3- Study of crop cultivation in dry farming and its relationship to the ecosystem

105. Course outcomes, teaching, learning and assessment methods

- Students will be able to learn about the methods used in dry areas.
- Students will learn how to grow crops in areas with low rainfall.
- It will enable students to know the crops that can be grown in dry areas.

for-**Course Skill Objectives**.

1- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
2- Ability to communicate and inquire with the subject teacher

Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on related topics.arid environment

**Teaching and learning methods**

Lecture No.theoryReport writing, seminars, laboratory training, and summer

training..

**Evaluation methods**

Daily written and oral tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Asking analytical and inferential questions.

G-**Emotional and value goals**

- It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.
- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, laboratory training, Summer trainingIn hospitals

**Evaluation methods**

Simulation of the medical condition, written and oral tests, midterm and final exams, daily tests, and assignment commitments.andReport making and then discussing reports, attendance and commitment,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.), inferential questions andArithmetic.

D-**General and transferable skills(Other skills related to employability and personal development).**

- Students are required to know the types of plants that tolerate drought before studying this subject..

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation** | **Teaching method** | **Unit name/Or the subject** | **theRequired outputs** | **Watches** | **The week** |
| a test | lecture, discussion, presentationMy presentation | **Drought and the nature of dry farming**:Drought and arid and semi-arid regions, nature of drought and its causes, dry regions of the world | Knowledge and application | 4 | 1 |
| a test | lecture, discussion, an offerMy presentation | **Factors affecting production in dry farming:**Plants, soil, climate, temperatures, light energy, atmospheric pressure, wind, rainfall,<br>**Cloud condensation and rain in agricultural areas:**Methods of implementation, requirements required to implement the condensation process, existing uses for cloud condensation and rain fall.<br>**Climate classification of the Arab world**Agricultural climatic regions in the Arab world,<br>**The role of water in plant growth:**The importance of water to plants, factors affecting water absorption by plants, transpiration | Knowledge and application | 4 | 2 |

| | | | | | |
|---|---|---|---|---|---|
| a testpractical | lecture, discussion, presentationMy presentation | **drought (water stress)**Its effects on plants, plant adaptation to water stress | Knowledge and application | 4 | 3 |
| a test | lecture, discussion, presentationMy presentation | **Drought and the nature of dry farming**:Drought and arid and semi-arid regions, the nature of drought and its causes, dry regions in the world | Knowledge and application | 4 | 4 |
| a test | lecture, discussion, presentationMy presentation | **Factors affecting production in dry farming:**Plants, soil, climate, temperatures, light energy, atmospheric pressure, wind, rainfall, | Knowledge and application | 4 | 5 |
| a testpractical | lecture, discussion, presentationMy presentation | **Cloud condensation and rain in agricultural areas:**Methods of implementation, requirements required to implement the condensation process, existing uses for cloud condensation and rain fall. | Knowledge and application | 4 | 6 |
| a test | lecture, discussion, presentationMy | **The role of water in plant growth:**The importance of water to plants, factors affecting water absorption by | Knowledge and application | 4 | 7 |

| | | | | | |
|---|---|---|---|---|---|
| | presentation | plants, transpiration | | | |
| practical control | lecture, discussion, presentationMy presentation | **drought (water stress)**Its effects on plants, plant adaptation to water stress<br>**Development of dry farming:**Economic and social conditions in dry farming areas. | Knowledge and application | 4 | 8 |
| practical control | lecture, discussion, presentation | **Crop cultivation under dry farming conditions**<br>**Field operations and agricultural mechanization in dry farming,**<br>**Agriculture in dry farming**: Municipal agriculture, mechanical agriculture, modern trends in agriculture, soil surface mulch cultivationstuble mulch farming, minimum tillage | Knowledge and application | 4 | 9 |
| a test | lecture, discussion, presentation | **Equipment and machinery suitable for crop production in dry farming**<br>**Moisture conservation and soil maintenance:**Factors affecting soil moisture conservation, methods used to conserve | Knowledge and application | 4 | 10 |

| | | | | | |
|---|---|---|---|---|---|
| | | moisture, methods of soil protection from erosion, damages of erosion | | | |
| a test | lecture, discussion, presentation | **Crop cultivation under dry farming conditions**<br>**Field operations and agricultural mechanization in dry farming,** | Knowledge and application | 4 | 11 |
| practical control | lecture, discussion, an offer My presentation | **Agriculture in dry farming**: Municipal agriculture, mechanical agriculture, modern trends in agriculture, soil surface mulch cultivationstuble mulch farming, minimum tillage | Knowledge and application | 4 | 12 |
| practical control | lecture, discussion, presentation | **Equipment and machinery suitable for crop production in dry farming** | Knowledge and application | 4 | 13 |
| a test | lecture, discussion, presentation | **Agricultural operations in dry farming,**Fertilization under dry farming conditions<br>**Pests in dry farming, weeds,**Insects | Knowledge and application | 4 | 14 |
| practica | lecture, | **Moisture conservation and soil** | Knowledge and | 4 | 15 |

| | | | | | |
|---|---|---|---|---|---|
| l control | discussion , presentation | **maintenance:**Factors affecting soil moisture conservation, methods used to conserve moisture, methods of soil protection from erosion, damages of erosion | application | | |
| | | | | | |

| **106. Infrastructure** | |
|---|---|
| | 1Required textbooks |
| | 2Main references(Sources) |
| | A- Recommended books and references(MagazinesScientific, Reports,.... ) |
| | B - Electronic references,Websites. |

| **107. Curriculum Development Plan** |
|---|
| Review of modern scientific literature<br>3- Participation in relevant scientific conferences<br>4- Hosting specialized professors<br>5- Scientific pairing with Sections Debate in Institutes and other universities |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **108. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **109. the university/Scientific Department** |
| Basics of Organic Chemistry | **110. name/Course code** |
| | **111. The program(s) that youincomeIn itA** |
| 22- Weekly class schedule(Theoretical and practical).<br>23- Discussions, scientific seminars and other extracurricular activities | **112. Available attendance forms** |
| Decisions. | **113. the chapter/Year** |
| 60hour (Number of theoretical and practical hours during the 15 weeks) | **114. Number of study hours(Total)** |
| //**2024**. | **115. Date this description was prepared** |

116. Course objectives

7- Teaching and training the student on how toPreparation of chemical compounds.

8- Educating and training the student onUse chemicals safely, participate in product development, and protect the environment and health from harmful chemicals.

9- Educating and training the student onTypes of chemicals and how to handle them.

117. Course outcomes, teaching, learning and assessment methods

A-**Cognitive objectives**

A1-Get to knowChemical composition Membership.

A2-Get to knowHow to distinguish between types of organic chemicals.

A3-Get to knowHow to manufacture, create and provide new products to society as they enter into food, cosmetics, pharmaceutical, fuel, petroleum and plastic industries.

| |
|---|
| for**-Course Skill Objectives**.<br>for1-Training onPreparation of chemicals Membership.<br>for2 -Training students on how toDistinguish between types of chemicals.<br>for3 -Training ofStudents on occupational safety procedures in the laboratory.<br>for4 -Training AProvide first aid in case of any accidents inside the laboratory. |
| **Teaching and learning methods** |
| Traditional lecture, report writing, seminars, practical training in the laboratory |
| **Evaluation methods** |
| Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions. |
| G-**Emotional and value goals**<br>G1-The student should be able to prepare some solutions.<br>G2-Distinguish between different chemicals<br>G3-Use scientific tools and equipment and handle them properly<br>G4-Detection of important chemicals and compounds |
| **Teaching and learning methods** |
| Traditional lecture, self-learning, feedback, deductive and analytical reasoning questions, systematic training in laboratories, practical training and summer training. |
| **Evaluation methods** |
| Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Inferential and deductive questions. |
| D-**General and transferable skills(Other skills related to employability** |

**and personal development).**

D1-Field visits to gain experience from others.

D2-Keeping up to date with scientific developments in the field of specialization(Educational videos).

| 118. Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, And a laboratory | Introduction to organic chemistry, organic compounds found in nature, and pollution by organic compounds. | Introduction to organic chemistry, organic compounds present in nature, pollution with organic compounds | | 1 |
| a test | a lectureAnd a laboratory | Hybridization methods of hydrocarbon compounds | Hybridization methane, ethylene, acetylene, | 4 | 2 |
| a test | a lecture, And a laboratory | Classification, reactions, nomenclature and properties of hydrocarbons | Hydrocarbons Classification alkane, alkenes, benzene example, reaction, nomenclature, properties | 4 | 3 |
| a test | a lecture, And a laboratory | Examples of alkanes, their naming, reactions and properties | Alkynes, Example, Nomenclature, Properties, Reaction | 4 | 4 |
| a test | a lecture, And a laboratory | Aromatic compounds and their nomenclature, polycyclic compounds and electrophilic substitution for cyclic compounds | Aromatic compound, Names, Polycyclic aromatic compound, Electrophilic aromatic substitutions | 4 | 5 |
| a test | a lecture, And a laboratory | Preparation of phenolic compounds, their reactions and properties | Phenols, Synthesis, Reaction, Properties | 4 | 6 |

| | | | | | |
|---|---|---|---|---|---|
| a test | a lecture, And a laboratory | Alcohols, their classification, reactions and properties | Alcohols, Classification and properties, Reactions | 4 | 7 |
| a test | a lecture, And a laboratory | Aldehydes, their classification, properties and reactions | Aldehyde's, Classification and properties, Reactions | 4 | 8 |
| a test | a lecture, And a laboratory | Ketones, their properties and reactions | Ketones, Classification and properties, Reactions | 4 | 9 |
| a test | a lecture, And a laboratory | Carboxylic acid compounds, their classification, reactions and preparations | Carboxylic acid, Classification and properties, Reactions | 4 | 10 |
| a test | a lecture, And a laboratory | Ester compounds, their reactions and properties | Ester, Reaction and Properties | 4 | 11 |
| a test | a lecture, | Ether compounds, their nomenclature, preparation, reactions and properties | Ether, Nomenclature and properties | 4 | 12 |
| a test | a lecture, And a laboratory | NMR and IR spectra | IR and UV spectroscopy. | 4 | 13 |
| a test | a lecture, And a laboratory | | Heterocyclic | 4 | 14 |

| | | | | | |
|---|---|---|---|---|---|
| a test | Lecture, MTest | stereochemistry | Stereochemistry. | 4 | 15 |

| **119. Infrastructure** | |
|---|---|
| | 1Required textbooks |
| 1 - Organic chemistry, 6thEd, Morrison & Boyd, Prentice Hall of India, 2/19/2016 | 2Main references(Sources) |
| | A- Recommended books and references(Scientific journals,Reports,....) |
| 2-Advanced Organic Chemistry. Reactions and Synthesis, Ed4(Part B), Carey F., Sundberg R., Kluwer 2000.<br>3-Organic chemistry, Ed5, Carey FA, MGH 2004. | B - Electronic references,Websites.... |

| **120. Curriculum Development Plan** |
|---|
| Review of modern scientific literature<br>6- Participation in relevant scientific conferences<br>7- The teaching and training staff are fully dedicated to application and partial work in hospitals.<br>8- Hosting specialized professors<br>9- Scientific affiliation with other universities and similar colleges |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **121. Educational institution** |
| Agricultural Technical CollegeMosul/Technical departmentCombating desertification | **122. the university/Scientific Department** |
| Analytical Chemistry | **123. name/Course code** |
| | **124. The program(s) that youincomeIn itA** |
| 24- Weekly class schedule(Theoretical and practical).<br>25- Discussions, scientific seminars and other extracurricular activities | **125. Available attendance forms** |
| Decisions. | **126. the chapter/Year** |
| 60hour (Number of theoretical and practical hours during the 15 weeks) | **127. Number of study hours(Total)** |
| //**2024**. | **128. Date this description was prepared** |

129. Course objectives

1- The student learns the basic concepts and principles of analytical chemistry, including chemical reactions and methods for calculating different concentrations.
2- The student will discuss the principles of chemical analysis of various materials, including basic ones such as chemical titration and its different types such as spectroscopy and chromatography.
3- The student will be able to apply these different methods in choosing the most appropriate one to analyze each material according to its properties and components.
4- The student will be able to apply this knowledge to different medicines to determine the concentration of active ingredients in them and ensure that they comply with specifications.

10. Course outcomes, teaching, learning and assessment methods

**A- Cognitive objectives**

**A1- Identify the principlesBasicIn analytical chemistry in its various aspects**

**A2- Correct and accurate handling of chemicals**

**A3 - Conducting practical experiments in analytical chemistry to detect different elements and compounds.**

**A4- Developing the student's ability to useToolsGlass and the benefit of each tool and how to use it and teach the student to use itToolsCorrection and principlesBasicFor scanning technologyYes**

**A5- Study different methodsInteractionsChemical like neutralizationAnd oxidation And abbreviationSedimentation and complex formation**

**B - Course specific skill objectives.**

**B1- Acquiring the skill of identifying the type of substance that can be obtained when mixed with different chemical substances.**

**B2 - Acquiring the skill of dealing with corrosive chemicals such as acids and bases**

**B3 - Acquiring the skill of writing scientific reports**

**B4- Increase the student's ability to work individually or collaboratively.duringgroup**

**Teaching and learning methods**

Traditional lecture, report writing, seminars, laboratory practical training, hospital-based systematic training, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

A1- Use and cleaning of laboratory equipment.

A2- Able to work with different chemical reagents.

| |
|---|
| A3- Able to prepare a solution with different concentrations.<br><br>A4- Able to use laboratory tools. |
| **Teaching and learning methods** |
| Traditional lecture, self-learning, feedback, deductive and analytical reasoning questions, systematic training in laboratories, practical training and summer training. |
| **Evaluation methods** |
| Written, oral and practical tests, midterm and final exams, daily tests, and assignments such as reporting in the field ofSpecializationThen discuss reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Inferential and deductive questions. |
| D-**General and transferable skills(Other skills related to employability and personal development).**<br><br>D1-Field visits to gain experience from others.<br><br>D2-Keeping up to date with scientific developments in the fieldSpecialization (Educational videos). |

| Course structure | | | | | |
|---|---|---|---|---|---|
| Evaluation method | Teaching method | Unit name/topic | Required learning outcomes | Watches | The week |
| **Daily exam, semester exam, scientific reports** | 1- Method of giving lectures<br>2- Student groups<br>3- Worksho ps<br>4- Reports and studies | Introduction of analytical chemistry | Introduction to Analytical Chemistry | 4 | 1 |
| **Daily exam, semester exam, scientific reports** | 1- Method of giving lectures<br>2- Student groups<br>3- Worksho ps<br>4- Reports and studies | Review of elementary concept important to analytical chemistry: strong and weak electrolytes; important weight and concentration units. | Student knowledge of the principles of analytical chemistry: strong and weak electrolytes, weights and their units of measurement. | 4 | 2 |
| **Daily exam, semester exam,** | 1- Method of giving | The evaluation of analytical data: Definition | Knowing how to estimate analytical data | 4 | 3 |

| | | | | | |
|---|---|---|---|---|---|
| **scientific reports** | lectures<br>2- Student groups<br>3- Workshops<br>4- Reports and studies | of terms. | and knowing some important terms in analytical chemistry | | |
| **Daily exam, semester exam, scientific reports** | 1- Method of giving lectures<br>2- Student groups<br>3- Workshops<br>4- Reports and studies | An introduction to gravimetric analysis: precipitation methods; gravimetric factor | Knowledge of quantitative gravimetric analysis methods, sedimentation methods and gravimetric coefficient | 4 | 4 |
| **Daily exam, semester exam, scientific reports** | 1- Method of giving lectures<br>2- Student groups<br>3- Workshops<br>4- | The scope of applications of gravimetric analysis: Inorganic precipitating agents; organic precipitating agents | Knowledge of quantitative analysis applications and types of inorganic and organic precipitating agents | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| | Reports and studies | | | | |
| **Daily exam, semester exam, scientific reports** | 1- Method of giving lectures<br>2- Student groups<br>3- Workshops<br>4- Reports and studies | An introduction to volumetric methods of analysis: | Knowledge of volumetric analysis methods | 4 | 6 |
| | | Volumetric calculations; acid-base equilibria and pH calculations. | Knowing the volumetric calculations and the chemical equilibrium between acid and base and how to calculate the pH | 4 | 7 |
| **Daily exam, semester exam, scientific reports** | 1- Method of giving lectures<br>2- Student groups<br>3- Workshops<br>4- | Buffer solutions: | Study of buffer solutions | 4 | 8 |

| | | | | | |
|---|---|---|---|---|---|
| | Reports and studies | | | | |
| | | Theory of neutralization titrations of simple system. | Theoretical study of equilibrium corrections for simple systems | 4 | 9 |
| **Daily exam, semester exam, scientific reports** | 1- Method of giving lectures<br>2- Student groups<br>3- Workshops<br>4- Reports and studies | Theory of neutralization titrations of complex system | Aspect study of the equilibrium corrections of complex systems | 4 | 10 |
| | | Precipitation titrations. | Sedimentation refinements | 4 | 11 |
| **Daily exam, semester exam, scientific reports** | 1- Method of giving lectures<br>2- Student groups<br>3- Workshops<br>4- Reports | Calculation of pH in complex system; Volumetric Methods based on complex system. | Methods for calculating the pH of complex systems: approved volumetric methods for complex systems | 4 | 12 |

| | | | | | |
|---|---|---|---|---|---|
| | and studies | | | | |
| **Daily exam, semester exam, scientific reports** | 1- Method of giving lectures<br>2- Student groups<br>3- Worksho ps<br>4- Reports and studies | Equilibria in oxidation-reduction system; theory of oxidation-reduction titrations. | Chemical equilibrium: oxidation and reduction reactions | 4 | 13 |
| **Daily exam, semester exam, scientific reports** | 1- Method of giving lectures<br>2- Student groups<br>3- Worksho ps<br>4- Reports and studies | Spectrophoto metric analysis: An introduction to optical methods of analysis | Introduction to spectroscopic chemical analysis methods | 4 | 14 |
| **Daily exam, semester exam, scientific reports** | 1- Method of giving lectures<br>2- Student | Beer-limber'slaw-calibration curve. | Beer Lambert Law Curves | 4 | 15 |

| | | | | | |
|---|---|---|---|---|---|
| | groups<br>3- Worksho ps<br>And studies | | | | |

| Infrastructure | |
|---|---|
| 1. Fundamentals of Analytical Chemistry - Douglas A.Skoog – Donald M.West - 3rd Edition,1976<br>2. Fundamentals of Analytical Chemistry- Mr. Dr.Mohamed Magdy Abdullah Wassel-Arab Republic of Egypt<br>3. Summary of solving problems in quantitative analytical chemistry- Prof. Dr. Munther Salim Abdul Latif - 2016 | 1- Required textbooks |
| | 2- Main references (sources) |
| Scientific journals in the fields of analytical chemistry | A- Recommended books and references(Scientific journals, reports, ....) |
| Specialized websites | B - Electronic references, Internet sites |

| 10. Curriculum Development Plan |
|---|
| Adding vocabulary to the curricula within the development taking place intheScheduled and proportionedDo not exceed 5% |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **130. Educational institution** |
| Agricultural Technical CollegeMosul/Technical departmentCombating desertification | **131. the university/Scientific Department** |
| gardeningDES251 | **132. name/Course code** |
| | **133. The program(s) that youincomeIn itA** |
| 26- Weekly class schedule(Theoretical and practical).<br>27- Discussions, scientific seminars and other extracurricular activities | **134. Available attendance forms** |
| Decisions. | **135. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **136. Number of study hours(Total)** |
| **8/1/2024.** | **137. Date this description was prepared** |

138. Course objectives

1- This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether the student has made the most of the learning opportunities available. It must be linked to the programme description.

139. Course outcomes, teaching, learning and assessment methods

ث- Cognitive objectives

- Ability to identify water management elements in arid areas
- Study of plants and their relationship to the ecosystem and climate elements in arid regions

Learn about the plant succession, climatic regions of Iraq and the types of environment in it.

for**-Course Skill Objectives**.

1- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
2- Ability to communicate and inquire with the subject teacher

Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on topics related to the environment and dry areas.

| |
|---|
| **Teaching and learning methods** |
| Traditional lecture, report writing, seminars, laboratory hands-on training, and summer training.. |
| **Evaluation methods** |
| Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions. |
| G-**Emotional and value goals**<br>1 .Tests DailyTheoretical and practical quarterly and annual<br>.2.Daily discussion<br>3. Discussing quarterly and annual scientific research.<br>4. Reports and seminars. |
| **Teaching and learning methods** |
| Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training.. |
| **Evaluation methods** |
| Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive. |
| D-**General and transferable skills(Other skills related to employability and personal development).**<br>After completing the lesson (lecture), the student will be able to:<br>• Learn about the types of garden plants<br>• Determine the appropriate types of plants according to the environment<br>Plant disease protection |

| 11. Infrastructure | |
|---|---|
| | 1- Required textbooks |
| | 2- Main references (sources) |
| | A- Recommended books and references(Scientific journals, reports, ....) |
| Specialized websites | B - Electronic references, websites... |

| 12. Curriculum Development Plan |
|---|
| - Continuous updating of the curriculum prescribed for students to serve the educational process - Maintaining academic integrity by using valuable sources and international books |

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | theoretical | Green production | AAdd learning outcomes | 4 | 1 |
| a test | theoretical | Plant breeding | AAdd learning outcomes | 4 | 2 |
| a test | theoretical | beekeeping | AAdd learning outcomes | 4 | 3 |
| a test | theoretical | Fallen fruit | AAdd learning outcomes | 4 | 4 |
| a test | theoretical | Medicinal and aromatic plants | AAdd learning outcomes | 4 | 5 |
| a test | theoretical | Ornamental plants | AAdd learning outcomes | 4 | 6 |
| a test | theoretical | Horticultural plant diseases | AAdd learning outcomes | 4 | 7 |
| a test | theoretical | Green production | AAdd learning outcomes | 4 | 8 |
| a test | theoretical | Farm management | AAdd learning outcomes | 4 | 9 |
| a test | theoretical | Seed production | AAdd learning outcomes | 4 | 10 |
| a test | theoretical | Harvest, care and storage | AAdd learning outcomes | 4 | 11 |
| a test | theoretical | Protected agriculture | AAdd learning outcomes | 4 | 12 |
| a test | theoretical | sustainable fruit | AAdd learning outcomes | 4 | 13 |
| a test | theoretical | Landscape Architecture | AAdd learning outcomes | 4 | 14 |

| | | | | | |
|---|---|---|---|---|---|
| a test | theoreti cal | Green production | AAdd learning outcomes | 4 | 15 |

## Course Description

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **140. Educational institution** |
| Technical InstituteMedical Mosul/Technical departmentT Pharmacy | **141. the university/Scientific Department** |
| geologic**DES155** | **142. name/Course code** |
| | **143. The program(s) that youincomeIn itA** |
| 28- Weekly lesson schedule (theoretical and practical).<br>29- Discussions, scientific seminars and other extracurricular activities | **144. Available attendance forms** |
| Decisions. | **145. the chapter/Year** |
| 240hour (Number of theoretical and practical hours during the 15 weeks) | **146. Number of study hours(Total)** |
| **8/1/2024.** | **147. Date this description was prepared** |
| 148. Course objectives<br><br>1- Learn about the types of geological layers of the Earth<br>2- Study of information related to the layers of the Earth from a geological | |

perspective

149. Course outcomes, teaching, learning and assessment methods

- Students will be able to identify land types from a geological perspective.
- Students will learn how to deal with soils of different geological nature.
- It will enable students to know the layers of the Earth.

for**-Course Skill Objectives**.

1- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
2- Ability to communicate and inquire with the subject teacher

Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on related topics.GeologistAndthe earth

**Teaching and learning methods**

Traditional lecture, report writing, seminars, laboratory hands-on training, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.
- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training..

**Evaluation methods**

| |
|---|
| Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Inferential and deductive questions. |
| D-**General and transferable skills(Other skills related to employability and personal development).**<br>D1-Field visits to gain experience from others.<br>D2-Keeping up to date with scientific developments in the field of specialization(Educational videos).<br>D3-Practical training |

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, And a laboratory | Definition of Geographic Information System, installation of the program, - familiarization with the program interface"ARC GIS 9.3" | Knowledge and application | 4 | 1 |
| a test | a lecture, And a laboratory | formation"Shapefile"For the features that represent the map's features, taking into account the rules and principles of cartographic representation. Determine the map elements."Point, Line, Polygon". | Knowledge and application | 4 | 2 |
| a test | a lecture, And a laboratory | Working with the toolbar"Tools".<br>-Working with the standard toolbar | Knowledge and application | 4 | 3 |
| a test | a lecture, And a laboratory | Working with the toolbar""Editor Toolbar .<br>Drawing tools in the menuSketch tooland menu commands"Edit"On display | Knowledge and application | 4 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| a test | a lecture, And a laboratory | Dealing with the toolbarEffect". | Knowledge and application | 4 | 5 |
| a test | a lecture, And a laboratory | - Types of lines and colors for landmarks.<br>Toolbar"Advance editing" | Knowledge and application | 4 | 6 |
| a test | a lecture, And a laboratory | -Preparing the map for printing and working with the ribbon toolsLayout<br>Ribbon ToolsInsert" to insert map elements. | Knowledge and application | 4 | 7 |
| a test | a lecture, | Spreadsheets, entering metadata related to point, line and area spatial data. | Knowledge and application | 4 | 8 |
| a test | a lecture, | Data processing (selecting features using spreadsheets, selecting features based on their location from other features, selecting features | Knowledge and application | 4 | 9 |

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|---|---|---|---|---|---|
| | | using a shape, dialog box)Statistics", Summarize dialog box | | | |
| a test | a lecture, | Spatial analysis of data in GIS, spatial analysis of linear data (topological matching and its types, spatial analysis in the surveying system (cellular), digital elevation modelDEM, regular and irregular grid structure, extrapolation of data from digital elevation model (DEM), derivation of contour maps, aspect maps, hill shade maps, slope maps, view shed, profiles, production of drainage network maps. | Knowledge and application | 4 | 10 |
| a test | a lecture, | - Digital elevation model). Non-spatial data sources | Knowledge and application | 4 | 11 |
| a test | a lecture, | - Survey data sourcesSources of Raster Data - Primary sources Secondary sources | Knowledge and application | 4 | 12 |

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|---|---|---|---|---|---|
| | | (maps of all kinds, aerial photographs, satellite data and visuals, GPS, | | | |
| a test | a lecture, | Entering spatial data into the computer (the concept of the process of entering spatial and descriptive data, criteria for evaluating spatial data, -- methods of entering spatial data into the computer (using a numbering device)Manual and automatic digitizer and their features.<br>-Coordinate system.<br>-Projection classification of maps.<br>-Coordinate definition, map correction and map projection selection.<br>-Steps to represent | NMR and IR spectra | 4 | 13 |

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|---|---|---|---|---|---|
| | | the corrected map features using the programARC GIS".<br>-Create layers for the features that make up the map. | | | |
| a test | a lecture, | Representation of point, linear and area phenomena of map features. | Knowledge and application | 4 | 14 |
| a test | Lecture, MTest | Spatial analysis of data in GIS, spatial analysis of linear data (topological matching and its types, spatial analysis in the surveying system (cellular), digital elevation model)DEM, regular and irregular grid structure, extrapolation of data from digital elevation model (DEM), derivation of contour maps, aspect maps, hill shade maps,[1]Slope mapsSlope, View shed, Profile, Drainage | Knowledge and application | 4 | 15 |

| | | | | | |
|---|---|---|---|---|---|
| | | network map production | | | |

| **150. Infrastructure** | |
|---|---|
| | 1Required textbooks |
| | 2Main references(Sources) |
| | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| **151. Curriculum Development Plan** |
|---|
| 10- Review of modern scientific literature<br>11- Participation in relevant scientific conferences<br>12- Dedicating the teaching and training staff to application and work<br>13- Hosting specialized professors<br>14- Scientific affiliation with other universities and similar colleges |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **152. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **153. the university/Scientific Department** |
| GeomorphologyDES205 | **154. name/Course code** |
| | **155. The program(s) that youincomeIn itA** |
| 3- Weekly class schedule(Theoretical and practical).<br>4- Discussions, scientific seminars and other extracurricular activities | **156. Available attendance forms** |
| Decisions. | **157. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **158. Number of study hours(Total)** |
| //**2024**. | **159. Date this description was prepared** |

160. Course objectives

- Get to knowTypesGeomorphological layers
- Study of information related to the forms of the earth's layers
- Study classification of formsthe earthAnd its relationship to the ecosystem

161. Course outcomes, teaching, learning and assessment methods

- Students will be able to learn about different types of environments.
- Students will learn about external and internal geomorphological processes.
- It will enable students to learn how to classify landforms in different environments.

for-**Course Skill Objectives**.

1- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
2- Ability to communicate and inquire with the subject teacher
3- Writing reports related to the subject's vocabulary after identifying the

scientific sources available in the library on related topics.environmentLandsDry

**Teaching and learning methods**

Traditional lecture, report writing, seminars, laboratory hands-on training, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.
- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability and personal development).**

D1-Field visits to gain experience from others.

D2-Keeping up to date with scientific developments in the field of

| |
|---|
| specialization(Educational videos). |

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | Definition of geomorphology and its relationship to other sciences | Knowledge and application | 4 | 1 |
| a test | a lecture | Basic concepts in geomorphology<br>Classification of landforms in terrestrial environments | Knowledge and application | 4 | 2 |
| a test | a lecture, | Desert environment and the resulting forms | Knowledge and application | 4 | 3 |
| a test | a lecture, | Basic concepts in geomorphology<br>External and internal geomorphological processes | Knowledge and application | 4 | 4 |
| a test | a lecture, | Landslides and their classification | Knowledge and application | 4 | 5 |
| a test | a lecture, | Desert environment and the resulting forms | Knowledge and application | 4 | 6 |
| a test | a lecture, | River environment and | Knowledge and | 4 | 7 |

| | | | | | |
|---|---|---|---|---|---|
| | | the resulting forms, types of drainage patterns | application | | |
| a test | a lecture, | Morphometric analysis of river basins | Knowledge and application | 4 | 8 |
| a test | a lecture, | Coastal and glacial environments and their resulting forms | Knowledge and application | 4 | 9 |
| a test | a lecture, | Climate regions and basic concepts | Knowledge and application | 4 | 10 |
| a test | a lecture, | Structural environment (folds and faults, karst regions and their types) | Knowledge and application | 4 | 11 |
| a test | a lecture, | Applied Geomorphology, Geomorphological Maps and Geomorphological Units | Knowledge and application | 4 | 12 |
| a test | a lecture, | Running water, wind, groundwater and their role in shaping the Earth's surface and the resulting shapes | Knowledge and application | 4 | 13 |
| a test | a lecture, | Applied Geomorphology, Geomorphological Maps and Geomorphological Units | Knowledge and application | 4 | 14 |
| a test | a lecture, | | Knowledge and application | 4 | 15 |

| **Infrastructure** | |
|---|---|
| | 1Required textbooks |

| | |
|---|---|
| | 2Main references(Sources) |
| | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| Curriculum Development Plan |
| --- |
| Review of modern scientific literature<br>1- Participation in relevant scientific conferences<br>2- Dedicating the teaching and training staff to application and work<br>3- Hosting specialized professors<br>4- Scientific affiliation with other universities and similar colleges |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **162. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **163. the university/Scientific Department** |
| Conditioned agriculture**DES352** | **164. name/Course code** |
| | **165. The program(s) that youincomeIn itA** |
| 5- Weekly class schedule(Theoretical and practical).<br>6- Discussions, scientific seminars and other extracurricular activities | **166. Available attendance forms** |
| Decisions. | **167. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **168. Number of study hours(Total)** |
| //**2024**. | **169. Date this description was prepared** |

170. Course objectives

- Teaching and introducing students to adaptive agriculture, its goals, purposes, and distribution in the world, the foundations of its establishment, the systems followed in it, and examples of producing some crops using it.

171. Course outcomes, teaching, learning and assessment methods

ج- Cognitive objectives

- Ability to identify water management elements in arid areas
- Study of plants and their relationship to the ecosystem and climate elements in arid regions
- Learn about the plant succession, climatic regions of Iraq and the types of environment in it.
-

for-**Course Skill Objectives**.

1- The ability to discuss in a scientific spirit and express what he finds

difficult in studying the subject.

2- Ability to communicate and inquire with the subject teacher

3- Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on topics related to the environment and dry areas.

**Teaching and learning methods**

Traditional lecture, report writing, conducting seminars, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- 1- What the student studies should be consistent with his inclinations and thinking trends.
- 2- The student should feel the importance of correcting refractive errors in the eye.
- 3- The student should listen carefully to the teacher's explanation.
- 4- That the student feels what cognitive distinction and excellence mean.
- 5- The student should learn about the impact of science and scientists.
- 6- The student should respect time and class system.

**Teaching and learning methods**

Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability**

**and personal development).**

D1-Field visits to gain experience from others.

D2-Keeping up to date with scientific developments in the field of specialization(Educational videos).

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | **Historical overview - Definition of adapted agriculture - Objectives and purposes. Geographical distribution in the world and Iraq.** | Knowledge and application | 4 | 1 |
| a test | a lecture | **Principles of establishing air-conditioned agricultural facilities - location - direction - area - shape.** | Knowledge and application | 4 | 2 |
| a test | a lecture, | **Climatic factors affecting plant growth in climate-controlled agriculture: temperature – light – humidity –CO2** | Knowledge and application | 4 | 3 |
| a test | a lecture, | **Soil factors affecting plant growth in adapted agriculture - types of agricultural media.** | Knowledge and application | 4 | 4 |
| a test | a lecture, | **Construction of plastic tunnels and plastic houses: shapes - types - plastic specifications.** | Knowledge and application | 4 | 5 |
| a test | a lecture, | **Building greenhouses: shapes, types, and types of glass.** | Knowledge and application | 4 | 6 |
| a test | a lecture, | **Methods of heating, cooling and ventilating air-conditioned homes.** | Knowledge and application | 4 | 7 |
| a test | a lecture, | **Production of vegetable seedlings in tunnels and air-conditioned houses.** | Knowledge and application | 4 | 8 |
| a test | a lecture, | **Indoor air-conditioned farming systems: farming in basins - rings - with machines - straw - bags - rock wool - hydroponics.** | Knowledge and application | 4 | 9 |
| a test | a lecture, | **Production of some vegetable crops: tomato production.** | Knowledge and application | 4 | 10 |
| a test | a lecture, | **Production of some vegetable crops: production of peppers and eggplants.** | Knowledge and application | 4 | 11 |
| a test | a lecture, | **Production of some vegetable crops: production of** | Knowledge and | 4 | 12 |

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|---|---|---|---|---|---|
| | | **cucumbers and squash** | application | | |
| a test | a lecture, | **Production of some vegetable crops: mushroom production** | Knowledge and application | 4 | 13 |
| a test | a lecture, | **Production of some fruit crops: production of sakura - banana.** | Knowledge and application | 4 | 14 |
| a test | a lecture, | | Knowledge and application | 4 | 15 |

| Infrastructure | |
|---|---|
| BooksScientific methodology in the field of specialization. | 1Required textbooks |
| • BooksSpecialized process. | 2Main references(Sources) |
| • General and specialized computer programs. | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| Curriculum Development Plan |
|---|
| Review of modern scientific literature<br>1- Participation in relevant scientific conferences<br>2- Dedicating the teaching and training staff to application and work<br>3- Hosting specialized professors<br>4- Scientific affiliation with other universities and similar colleges |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **172. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **173. the university/Scientific Department** |
| Field irrigation methods**DES101** | **174. name/Course code** |
| | **175. The program(s) that youincomeIn itA** |
| 7- Weekly class schedule(Theoretical and practical).<br>8- Discussions, scientific seminars and other extracurricular activities | **176. Available attendance forms** |
| Decisions. | **177. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **178. Number of study hours(Total)** |
| //**2024**. | **179. Date this description was prepared** |

180. Course objectives

- Teaching students about field irrigation methods and how to implement them in the field and conduct practices and experiments in this field.

181. Course outcomes, teaching, learning and assessment methods

ج- Cognitive objectives

- Ability to identify water management elements in arid areas
- Study of plants and their relationship to the ecosystem and climate elements in arid regions
- Learn about the plant succession, climatic regions of Iraq and the types of environment in it.
-

for-**Course Skill Objectives**.

- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
- Ability to communicate and inquire with the subject teacher
- Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on topics related to the environment and dry areas.

**Teaching and learning methods**

Traditional lecture, report writing, conducting seminars, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.
- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability and personal development).**

After completing the lesson (lecture), the student will be able to:
Determines the appropriate irrigation methods for the field, according to the type of plants, the condition of the field and the soil.

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | **Meaning of field irrigation, selection of irrigation method, field irrigation methods, surface irrigation, basin irrigation** | Knowledge and application | 4 | 1 |
| a test | a lecture | **Surface irrigation, strip irrigation, drip irrigation.** | Knowledge and application | 4 | 2 |
| a test | a lecture, | **Sprinkler irrigation, benefits and uses of sprinkler irrigation, disadvantages and difficulties** | Knowledge and application | 4 | 3 |
| a test | a lecture, | **Components of sprinkler irrigation system (pumping unit, pipe network, sprinklers, valves)T, scales)** | Knowledge and application | 4 | 4 |
| a test | a lecture, | **Types of sprinkler irrigation systems (fixed and mobile)** | Knowledge and application | 4 | 5 |
| a test | a lecture, | **Water distribution around the sprinkler, water distribution patterns** | Knowledge and application | 4 | 6 |
| a test | a lecture, | **Installation, installation, operation and maintenance of sprinkler irrigation system (fixed and mobile)** | Knowledge and application | 4 | 7 |
| a test | a lecture, | **Introduction to drip irrigation, definition of dripper, types of drippers, calculating the number of drippers.** | Knowledge and application | 4 | 8 |
| a test | a lecture, | **Complete drip irrigation network classification** | Knowledge and application | 4 | 9 |
| a test | a lecture, | **Installation and operation of drip irrigation, automatic self-operation** | Knowledge and application | 4 | 10 |
| a test | a lecture, | **Control device operation, pipe network operation, drippers and filters operation** | Knowledge and application | 4 | 11 |

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|---|---|---|---|---|---|
| a test | a lecture, | **Drip irrigation maintenance, mineral and organic sediment treatment, drip irrigation system cleaning** | Knowledge and application | 4 | 12 |
| a test | a lecture, | **Operating water wells fed by irrigation and drip systems** | Knowledge and application | 4 | 13 |
| a test | a lecture, | **Subsurface irrigation method, how to install, operate and maintain subsurface irrigation.** | Knowledge and application | 4 | 14 |
| a test | a lecture, | **Smart irrigation method, installation, operation and maintenance of this method.** | Knowledge and application | 4 | 15 |

| **Infrastructure** | |
|---|---|
| | 1Required textbooks |
| | 2Main references(Sources) |
| | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

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|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **182. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **183. the university/Scientific Department** |
| Wind erosion prediction models**DES304** | **184. name/Course code** |
| | **185. The program(s) that youincomeIn itA** |
| 9- Weekly class schedule(Theoretical and practical).<br>10- Discussions, scientific seminars and other extracurricular activities | **186. Available attendance forms** |
| Decisions. | **187. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **188. Number of study hours(Total)** |
| //**2024**. | **189. Date this description was prepared** |

**Curriculum Developmen**

190. Course objectives

1 ● Introducing the student to the concept of wind erosion, its types, mechanics, types of winds, methods, techniques, and foundations of resistance and its environmental and economic risks.

2

3

4- Scientific affiliation with other universities and similar colleges

191. Course outcomes, teaching, learning and assessment methods

- Introducing the student to the concept of wind erosion, its types, mechanics, types of winds, methods, techniques, and foundations of resistance and its environmental and economic risks.

**Teaching and learning methods**

Traditional lecture, report writing, seminars, laboratory hands-on training, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.
- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability and personal development).**

D1-Field visits to gain experience from others.

D2-Keeping up to date with scientific developments in the field of specialization(Educational videos).

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | Introduction: The concept of erosion / Types of erosion / Wind erosion | Knowledge and application | 4 | 1 |
| a test | a lecture | Factors affecting wind erosionFactor affecting wind erosion<br>1-ClimateClimate: Wind / Rain / Temperature<br>2- Land usesLand use<br>3-TopographyTopography<br>4-Soil propertiesSoil characteristics | Knowledge and application | 4 | 2 |
| a test | a lecture, | Types of wind erosionType of wind erosion<br>1-winnowingAnd<br>2-Itching or scratchingAbrasion<br>3-CollapseAvalanching | Knowledge and application | 4 | 3 |
| a test | a lecture, | Wind erosion mechanism:erosion | Knowledge and | 4 | 4 |

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|---|---|---|---|---|---|
| | | mechanics wind<br>1- Soil disintegration and destructionSoil loss and disintegration<br>2- The beginning of the movementInitiation of soil movement<br>3- TransportationTransporting<br>4- SedimentationDeposition | application | | |
| a test | a lecture, | Forms of soil movement by wind:Type of soil movement by wind<br>1- Suspended movementSuspended load<br>2- JumpingSaltation<br>3-Surface creepCreep Surface | Knowledge and application | 4 | 5 |
| a test | a lecture, | Wind erosion hazardsHazard of wind erosion / Tolerance limit of wind erosion | Knowledge and application | 4 | 6 |
| a test | a lecture, | Major Attempts to Conserve Soil from Wind Erosion / Basic Principles of Wind Erosion Control | Knowledge and application | 4 | 7 |

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|---|---|---|---|---|---|
| a test | a lecture, | Wind erosion control methods - mechanical methodsWind erosion control -mechanical methods<br>PlowingTillage / No-tillage system / Emergency tillage / Mechanical barriers<br>The most important deciduous fruit trees in Iraq - importance - propagation methods - varieties - the most important service operations | Knowledge and application | 4 | 8 |
| a test | a lecture, | Wind erosion control methods - chemical methodsWind erosion control – chemical methods<br>CoversMulches / Natural and artificial mulches / Oils and petroleum derivatives | Knowledge and application | 4 | 9 |
| a test | a lecture, | Wind erosion control methods - chemical methodsWind erosion control – chemical methods<br>CoversMulches / Natural and artificial mulches / Oils and petroleum derivatives<br>The most important winter vegetables in | Knowledge and application | 4 | 10 |

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|---|---|---|---|---|---|
| | | Iraq | | | |
| a test | a lecture, | sand dunesSand dunes / Methods of sand dune stabilization – chemical and biological methods | Knowledge and application | 4 | 11 |
| a test | a lecture, | Economic and social impacts of wind erosionEconomic and social effect of wind erosion | Knowledge and application | 4 | 12 |
| a test | a lecture, | | Knowledge and application | 4 | 13 |
| a test | a lecture, | Dust storms / sources and agricultural impactsDust storms-the sources and its agricultural effectiveness | Knowledge and application | 4 | 14 |
| a test | a lecture, | | Knowledge and application | 4 | 15 |

| Infrastructure | |
|---|---|
| BooksScientific methodology in the field of specialization. | 1Required textbooks |
| • BooksSpecialized process. | 2Main references(Sources) |
| • General and specialized computer programs. | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| Curriculum Development Plan |
|---|
| Review of modern scientific literature<br>5- Participation in relevant scientific conferences<br>6- Dedicating the teaching and training staff to application and work<br>7- Hosting specialized professors<br>8- Scientific affiliation with other universities and similar colleges |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **192. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **193. the university/Scientific Department** |
| Field cropsDES154 | **194. name/Course code** |
| | **195. The program(s) that youincomeIn itA** |
| 11- Weekly class schedule(Theoretical and practical).<br>12- Discussions, scientific seminars and other extracurricular activities | **196. Available attendance forms** |
| Decisions. | **197. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **198. Number of study hours(Total)** |
| //**2024.** | **199. Date this description was prepared** |

200. Course objectives

- Students will be able to identify the types of field crops.
- Students will learn how to grow field crops.
- It will enable students to know the distribution of field crops.

201. Course outcomes, teaching, learning and assessment methods

1- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
2- Ability to communicate and inquire with the subject teacher
3- Writing reports related to the subject's vocabulary after identifying the scientific sources available in the library on related topics.Field crop environment

**Teaching and learning methods**

Traditional lecture, report writing, seminars, laboratory hands-on training, and

summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.
- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, self-study, feedback, deductive and analytical reasoning questions, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability and personal development).**

D1-Field visits to gain experience from others.

D2-Keeping up to date with scientific developments in the field of specialization(Educational videos).

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | Course introduction, learning objectives, course content | Knowledge and application | 4 | 1 |
| a test | a lecture | Field crop and field crop division | Knowledge and application | 4 | 2 |
| a test | a lecture, | Soil service operations / tillage - its importance - when to perform it - smoothing - leveling - modification<br>Fertilization, types of fertilizers, the importance of using fertilizers for plants<br>Crop cultivation methods - patching and weeding - thinning - fertilization - irrigation - pest control<br>Production of cereal and legume crops for seed purposes, importance of production of cereal and legume crops, cereal crops - wheat - barley, economic importance, suitable environmental conditions, crop service operations, growth stages, varieties. | Knowledge and application | 4 | 3 |
| a test | a lecture, | Rice and corn crop production, economic importance, suitable environmental conditions, crop service operations, ripening and harvesting.<br>Field crop and field crop division | Knowledge and application | 4 | 4 |
| a test | a lecture, | Soil service operations / tillage - its importance - when to perform it - smoothing - | Knowledge and application | 4 | 5 |

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| | | leveling - modification<br>Fertilization, types of fertilizers, the importance of using fertilizers for plants<br>Crop cultivation methods - patching and weeding - thinning - fertilization - irrigation - pest control | | | |
| a test | a lecture, | Production of cereal and legume crops for seed purposes, importance of production of cereal and legume crops, cereal crops - wheat - barley, economic importance, suitable environmental conditions, crop service operations, growth stages, varieties. | Knowledge and application | 4 | 6 |
| a test | a lecture, | Rice and corn crop production, economic importance, suitable environmental conditions, crop service operations, ripening and harvesting. | Knowledge and application | 4 | 7 |
| a test | a lecture, | Cereal crops - maize - rice, economic importance, suitable environmental conditions, crop service operations, maturity and harvesting | Knowledge and application | 4 | 8 |
| a test | a lecture, | Production of industrial crops, fiber crops (cotton, linseed, jute), economic importance, suitable environmental conditions, crop service operations, maturity signs, cotton harvesting, ginning and baling, manufacturing operations | Knowledge and application | 4 | 9 |
| a test | a lecture, | Tobacco crop production, economic importance, suitable environmental conditions, crop service operations, ripening and harvesting, leaf drying, | Knowledge and application | 4 | 10 |

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| | | conversion operations. | | | |
| a test | a lecture, | Sugar crop production, sugar beet, sugar cane, economic importance, suitable environmental conditions, crop service operations, ripening and harvesting. | Knowledge and application | 4 | 11 |
| a test | a lecture, | Oil crops - sunflower, soybean, economic importance, suitable environmental conditions, crop service operations, growth stages. | Knowledge and application | 4 | 12 |
| a test | a lecture, | Sesame crop production, economic importance, suitable environmental conditions, crop service operations, ripening and harvesting, manufacturing operations. | Knowledge and application | 4 | 13 |
| a test | a lecture, | Production of field pistachio and mung bean crops, economic importance, suitable environmental conditions, crop service operations, ripening and harvesting | Knowledge and application | 4 | 14 |
| a test | a lecture, | Leguminous crops - alfalfa - clover, economic importance, suitable environmental conditions, crop service operations | Knowledge and application | 4 | 15 |

| Infrastructure | |
|---|---|
| | 1Required textbooks |
| | 2Main references(Sources) |
| | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| Curriculum Development Plan |
|---|
| Review of modern scientific literature<br>1- Participation in relevant scientific conferences |

2- Dedicating the teaching and training staff to application and work
3- Hosting specialized professors
4- Scientific affiliation with other universities and similar colleges

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| Ministry of Higher Education and Scientific Research /Northern Technical University | **202. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **203. the university/Scientific Department** |
| Geographic Information Systems**3 45 DES** | **204. name/Course code** |
| | **205. The program(s) that youincomeIn itA** |
| 13- Weekly class schedule(Theoretical and practical).<br>14- Discussions, scientific seminars and other extracurricular activities | **206. Available attendance forms** |
| Decisions. | **207. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **208. Number of study hours(Total)** |
| //**2024**. | **209. Date this description was prepared** |

210. Course objectives

- Ability to identify geographic information systems.
- Study of geographical information in dry areas
- Study of plants and their relationship to the ecosystem and climate elements in arid regions

211. Course outcomes, teaching, learning and assessment methods

- The student should be able to identify the principles of geographic information systems, their components, their relationship to other sciences, their functions, and the technologies associated with them, and deal with them and use them to draw various plans and maps.

for-**Course Skill Objectives**.

- Teaching and introducing students to dryland plants - dry and semi-dry lands and their importance, dry farming systems, environmental factors prevailing

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| in drylands and their effects on plants. Types of plants used in dry farming. |
| **Teaching and learning methods** |
| Traditional lecture, report writing, seminars, laboratory hands-on training, and summer training.. |
| **Evaluation methods** |
| Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions. |
| G-**Emotional and value goals**<br>• It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.<br>• It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.<br>• That is, it causes a change in the learner's behavior. |
| **Teaching and learning methods** |
| Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training.. |
| **Evaluation methods** |
| Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive. |
| D-**General and transferable skills(Other skills related to employability and personal development).**<br>D1-Field visits to gain experience from others.<br>D2-Keeping up to date with scientific developments in the field of specialization(Educational videos). |

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | Course introduction, learning objectives, course content | Knowledge and application | 4 | 1 |
| a test | a lecture | **Definition of dryland plants - dry and semi-dry lands and their importance.** | Knowledge and application | 4 | 2 |
| a test | a lecture, | **Dry farming systems - their importance in providing food - the percentage of dry lands.** | Knowledge and application | 4 | 3 |
| a test | a lecture, | **Environmental factors prevailing in dry lands and their effects on plants.** | Knowledge and application | 4 | 4 |
| a test | a lecture, | **Water Resources in Arid Areas - Water Conservation and Storage - Water Consumption** | Knowledge and application | 4 | 5 |
| a test | a lecture, | **Amendment of organic matter in the soil.** | Knowledge and application | 4 | 6 |
| a test | a lecture, | **Modern irrigation systems prevailing in dry lands - and saving irrigation water** | Knowledge and application | 4 | 7 |
| a test | a lecture, | **Water harvesting in arid areas** | Knowledge and application | 4 | 8 |
| a test | a lecture, | **Transformations in dry areas** | Knowledge and application | 4 | 9 |
| a test | a lecture, | **Vegetation in desert lands** | Knowledge and application | 4 | 10 |
| a test | a lecture, | **Desert shrubs** | Knowledge and application | 4 | 11 |
| a test | a lecture, | **Planting green belts in desert areas** | Knowledge and application | 4 | 12 |

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|---|---|---|---|---|---|
| a test | a lecture, | **Medicinal plants in desert areas** | Knowledge and application | 4 | 13 |
| a test | a lecture, | **Cultivation of economic crops in dry areas (cereals - vegetables - fruits - fodder)** | Knowledge and application | 4 | 14 |
| a test | a lecture, | **Use of modern technologies such as sanoplant, hydrocolloids and perforated tubes under the soil.** | Knowledge and application | 4 | 15 |

| **Infrastructure** | |
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| | 1Required textbooks |
| | 2Main references(Sources) |
| | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

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| Ministry of Higher Education and Scientific Research /Northern Technical University | **212. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **213. the university/Scientific Department** |
| Dry area facilities**451 DES** | **214. name/Course code** |
| | **215. The program(s) that youincomeIn itA** |

| **Curriculum Development Plan** | |
|---|---|
| Review of modern scientific literature<br>1- Participation in relevant scientific conferences<br>2- Dedicating the teaching and training staff to application and work<br>3- Hosting specialized professors<br>4- Scientific affiliation with other universities and similar colleges | |
| 15- Weekly class schedule(Theoretical and practical).<br>16- Discussions, scientific seminars and other extracurricular activities | **216. Available attendance forms** |
| Decisions. | **217. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **218. Number of study hours(Total)** |
| //**2024**. | **219. Date this description was prepared** |
| 220. Course objectives | |

- Students will be able to identify dry areas.
- Students will learn about the types of climate in dry areas.
- It will enable students to learn about the morphology of drylands.
-

221. Course outcomes, teaching, learning and assessment methods

- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
- Ability to communicate and inquire with the subject teacher
- Writing reports related to the subject matter after identifying the scientific sources available in the library on topics related to fertilizers and fertilization

for-**Course Skill Objectives**.

- It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.
- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, report writing, seminars, laboratory hands-on training, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.
- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required

in the performance.

- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability and personal development).**

D1-Field visits to gain experience from others.

D2-Keeping up to date with scientific developments in the field of specialization(Educational videos).

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | Definition of dry areas | Knowledge and application | 4 | 1 |
| a test | a lecture | Nature and causes of drought | Knowledge and application | 4 | 2 |
| a test | a lecture, | Construction in dry areas | Knowledge and application | 4 | 3 |
| a test | a lecture, | Dams and their importance | Knowledge and application | 4 | 4 |
| a test | a lecture, | Forces affecting dams | Knowledge and application | 4 | 5 |
| a test | a lecture, | Types of climate in dry areas | Knowledge and application | 4 | 6 |
| a test | a lecture, | Dryland Morphology | Knowledge and application | 4 | 7 |
| a test | a lecture, | Geography of dry areas | Knowledge and application | 4 | 8 |
| a test | a lecture, | Dryland Biogeography | Knowledge and application | 4 | 9 |
| a test | a lecture, | Agriculture in dry areas | Knowledge and application | 4 | 10 |
| a test | a lecture, | Rainfed and dry farming | Knowledge and application | 4 | 11 |
| a test | a lecture, | Pastoralism in dry areas | Knowledge and application | 4 | 12 |
| a test | a lecture, | **Gas movement in soil** | Knowledge and application | 4 | 13 |
| a test | a lecture, | **soil heat movement** | Knowledge and application | 4 | 14 |
| a test | a lecture, | **Reverse modeling and** | Knowledge and | 4 | 15 |

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|---|---|---|---|---|---|
| | | **practical examples** | application | | |

| Infrastructure | |
|---|---|
| BooksScientific methodology in the field of specialization. | 1Required textbooks |
| • BooksSpecialized process. | 2Main references(Sources) |
| • General and specialized computer programs. | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| Curriculum Development Plan |
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| Review of modern scientific literature<br>1- Participation in relevant scientific conferences<br>2- Dedicating the teaching and training staff to application and work<br>3- Hosting specialized professors<br>4- Scientific affiliation with other universities and similar colleges |

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| Ministry of Higher Education and Scientific Research /Northern Technical University | **222. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **223. the university/Scientific Department** |
| Fertility and fertilization DES204 | **224. name/Course code** |
| | **225. The program(s) that youincomeIn itA** |
| 17- Weekly class schedule(Theoretical and practical).<br>18- Discussions, scientific seminars and other extracurricular activities | **226. Available attendance forms** |

| **Curriculum Development Plan** |
|---|
| Review of modern scientific literature<br>1- Participation in relevant scientific conferences<br>2- Dedicating the teaching and training staff to application and work<br>3- Hosting specialized professors<br>4- Scientific affiliation with other universities and similar colleges |

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|---|---|
| Decisions. | **227. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **228. Number of study hours(Total)** |
| //**2024**. | **229. Date this description was prepared** |

230. Course objectives

- Ability to identify water management elements in arid areas
- Study of plants and their relationship to the ecosystem and climate elements in arid regions
- Learn about the plant succession, climatic regions of Iraq and the types of environment in it.
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231. Course outcomes, teaching, learning and assessment methods

- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.

- Ability to communicate and inquire with the subject teacher
- Writing reports related to the subject matter after identifying the scientific sources available in the library on topics related to fertilizers and fertilization

for-**Course Skill Objectives**.

- That what the student studies is consistent with his inclinations and thinking trends
- The student should feel the importance of correcting refractive errors in the eye.
- The student should listen carefully to the teacher's explanation.
- The student should feel what cognitive distinction and excellence mean.
- The student should learn about the impact of science and scientists.
- 6- The student should respect time and class system.

**Teaching and learning methods**

Traditional lecture, report writing, conducting seminars, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- After completing the lesson (lecture), the student will be able to:
- Determines the type of soil suitable for the plant.
- Determines the physical and chemical properties of soil.
- Type of water suitable for irrigation

**Teaching and learning methods**

Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability and personal**

**development).**

D1-Field visits to gain experience from others.

D2-Keeping up to date with scientific developments in the field of specialization(Educational videos).

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | **Physical properties of soil and their effect on plant growth** | Knowledge and application | 4 | 1 |
| a test | a lecture | **Physical properties of soil and their effect on plant growth** | Knowledge and application | 4 | 2 |
| a test | a lecture, | **Chemical properties of soil and their effect on plant growth** | Knowledge and application | 4 | 3 |
| a test | a lecture, | **Chemical properties of soil and their effect on plant growth** | Knowledge and application | 4 | 4 |
| a test | a lecture, | **Chemical properties of soil and their effect on plant growth** | Knowledge and application | 4 | 5 |
| a test | a lecture, | **Soil salinity and its effect on plant growth** | Knowledge and application | 4 | 6 |
| a test | a lecture, | **Soil salinity and its effect on plant growth** | Knowledge and application | 4 | 7 |
| a test | a lecture, | **Mineral nutrition and its relationship to plant growth** | Knowledge and application | 4 | 8 |
| a test | a lecture, | **Mineral nutrition and its relationship to plant growth** | Knowledge and application | 4 | 9 |
| a test | a lecture, | **Water and its relationship to plant growth** | Knowledge and application | 4 | 10 |
| a test | a lecture, | **Water and its relationship to plant growth** | Knowledge and application | 4 | 11 |
| a test | a lecture, | **Water and its relationship to plant growth** | Knowledge and application | 4 | 12 |
| a test | a lecture, | **Water and its relationship to plant growth** | Knowledge and application | 4 | 13 |

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|---|---|---|---|---|---|
| a test | a lecture, | **Different stresses that the plant is exposed to** | Knowledge and application | 4 | 14 |
| a test | a lecture, | **Different stresses that the plant is exposed to** | Knowledge and application | 4 | 15 |

| Infrastructure | |
|---|---|
| BooksScientific methodology in the field of specialization. | 1Required textbooks |
| • BooksSpecialized process. | 2Main references(Sources) |
| • General and specialized computer programs. | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| Curriculum Development Plan |
|---|
| Review of modern scientific literature<br>1- Participation in relevant scientific conferences<br>2- Dedicating the teaching and training staff to application and work<br>3- Hosting specialized professors<br>4- Scientific affiliation with other universities and similar colleges |

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| Ministry of Higher Education and Scientific Research /Northern Technical University | **232. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **233. the university/Scientific Department** |
| Dryland pastures**3 45 DES** | **234. name/Course code** |
| | **235. The program(s) that youincomeIn itA** |
| 19- Weekly class schedule(Theoretical and practical).<br>20- Discussions, scientific seminars and other extracurricular activities | **236. Available attendance forms** |

| **Curriculum Development Plan** |
|---|
| Review of modern scientific literature<br>1- Participation in relevant scientific conferences<br>2- Dedicating the teaching and training staff to application and work<br>3- Hosting specialized professors<br>4- Scientific affiliation with other universities and similar colleges |

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| Decisions. | **237. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **238. Number of study hours(Total)** |
| //**2024**. | **239. Date this description was prepared** |
| 240. Course objectives | |
| • Defining the importance of natural pastures, methods of evaluating pasture plants, methods of caring for and improving natural and artificial pastures, the most important pastoral plants and means of preserving them, and focusing on the most important promising pastoral plants in dry areas. | |
| 241. Course outcomes, teaching, learning and assessment methods | |
| • After completing the lesson (lecture), the student will be able to: | |

- Distinguish between types of pastoral plants
- Assesses the level of overgrazing risk.

for-**Course Skill Objectives**.

- Providing the learner with the skills to identify the most important pastoral plants and methods of preserving and propagating them.
- Learn about ways to improve pastures, protect soil from erosion, and maintain its moisture.

**Teaching and learning methods**

Traditional lecture, report writing, conducting seminars, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.
- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability and personal development).**

D1-Field visits to gain experience from others.

| |
|---|
| D2-Keeping up to date with scientific developments in the field of specialization(Educational videos). |

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | Pastures, definition, types, economic importance of natural pastures, SpacesPastoral,yieldBotanical and pastoral rangelands | Knowledge and application | 4 | 1 |
| a test | a lecture | Features Home For pastures Natural in Homeland Arabic Environments Vegetarianism The Great in Homeland ArabicThe method used to exploit natural pastures in the desert. | Knowledge and application | 4 | 2 |
| a test | a lecture, | Problems and difficulties facing natural pastures in Iraq,FactorsRelated to humanitarian activities,FactorsRelated to agricultural activities,Factorsrelated to pastoral practices,FactorsRelated to land ownership, policies and laws,FactorsInstitutional related | Knowledge and application | 4 | 3 |
| a test | a lecture, | Qualitative aspects of natural pasture plants (natural vegetation and its distribution in pasture types, natural vegetation in deserts such as annual plants, perennial trees and perennial shrubs). | Knowledge and application | 4 | 4 |

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|---|---|---|---|---|---|
| a test | a lecture, | Patterns Pastoral And its impact on plants Pastures deterioration Lands Pastures Natural in Homeland Arabic,deterioration Lands Pastures Natural | Knowledge and application | 4 | 5 |
| a test | a lecture, | Factors Influential in deterioration Lands Pastoral , Indicators deterioration Lands Pastures Natural | Knowledge and application | 4 | 6 |
| a test | a lecture, | The basis of quantitative evaluation of pasture plants, important and basic indicators in determining pasture productivity, quantitative traits or measures, sampling methods | Knowledge and application | 4 | 7 |
| a test | a lecture, | Plants Pastoral And evaluation Its importance Relativity in Homeland Arabic, Criteria Importance Relativity For plants Pastoral, The standardEnvironmental, The standardFood,standardThe angelandWhat is it?yield | Knowledge and application | 4 | 8 |
| a test | a lecture, | look around Activities Qualification Pastures deteriorating And the material Plants used , Most important Plants Pastoral Promising, TreesPastoral,ShrubsPastoral, aFor the lawns,HerbsPastoral | Knowledge and application | 4 | 9 |

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|---|---|---|---|---|---|
| a test | a lecture, | Perceptions Futuristic For development And development Resources Pastoral to update And activate Policies And legislation The archer For development sustainable pastures | Knowledge and application | 4 | 10 |
| a test | a lecture, | situation And implementation Strategies And plans a job suitable For development Pastoral Resources,strengthening Frames Institutional same Relationship With qualification And management Pastoral Resources,Accreditation Approach ShareyourY in development And management Resources Pastoral | Knowledge and application | 4 | 11 |
| a test | a lecture, | building Capabilities Technical To qualify And management Resources Pastoral,to encourage Research And studies in area Resources Pastoral, to implement Packages Technical Promising on range wide | Knowledge and application | 4 | 12 |
| a test | a lecture, | Units Pastoral Home And integration Among them, Pastureswormwood,PasturesAllies,PasturesThe Shenan,Pasturessalinelands,PasturesSandylands | Knowledge and application | 4 | 13 |
| a test | a lecture, | Methods of caring for and improving natural pastures, reviving degraded grazing areas and exploiting available | Knowledge and application | 4 | 14 |
| a test | a lecture, | | Knowledge and application | 4 | 15 |

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|---|---|---|---|---|---|
| | | water resources. | | | |

| Infrastructure | |
|---|---|
| BooksScientific methodology in the field of specialization. | 1Required textbooks |
| • BooksSpecialized process. | 2Main references(Sources) |
| • General and specialized computer programs. | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| Curriculum Development Plan |
|---|
| Review of modern scientific literature<br>1- Participation in relevant scientific conferences<br>2- Dedicating the teaching and training staff to application and work<br>3- Hosting specialized professors<br>4- Scientific affiliation with other universities and similar colleges |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **242. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **243. the university/Scientific Department** |
| dryland communities**DES353** | **244. name/Course code** |
| | **245. The program(s) that youincomeIn itA** |
| 21- Weekly class schedule(Theoretical and practical).<br>22- Discussions, scientific seminars and other extracurricular activities | **246. Available attendance forms** |
| Decisions. | **247. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **248. Number of study hours(Total)** |
| //**2024**. | **249. Date this description was prepared** |

250. Course objectives

- This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether the student has made the most of the learning opportunities available. It must be linked to the programme description.

251. Course outcomes, teaching, learning and assessment methods

ج- Cognitive objectives

- Ability to identify water management elements in arid areas
- Study of plants and their relationship to the ecosystem and climate elements in arid regions
- Learn about the plant succession, climatic regions of Iraq and the types of environment in it.
-

for-**Course Skill Objectives**.

- It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.
- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, report writing, conducting seminars, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- After completing the lesson (lecture), the student will be able to:
- Get to know the rural community
- Get to know civil society
- Know the differences between them
- Determine the mechanism for dealing with each of them

**Teaching and learning methods**

Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability**

**and personal development).**

D1-Field visits to gain experience from others.

D2-Keeping up to date with scientific developments in the field of specialization(Educational videos).

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | Definition of sociology. Branches of sociology. Urban, rural and desert sociology. | Knowledge and application | 4 | 1 |
| a test | a lecture | Rural society. General characteristics of rural society | Knowledge and application | 4 | 2 |
| a test | a lecture, | Sahrawi society. Sahrawi society composition | Knowledge and application | 4 | 3 |
| a test | a lecture, | Characteristics of desert societies | Knowledge and application | 4 | 4 |
| a test | a lecture, | Population. Population density. Rural population. Population vital indicators. Migration. Migration factors. Rural housing patterns | Knowledge and application | 4 | 5 |
| a test | a lecture, | Growth and development in rural communities | Knowledge and application | 4 | 6 |
| a test | a lecture, | Economic Growth in Rural Communities Measure | Knowledge and application | 4 | 7 |
| a test | a lecture, | Rural development problems | Knowledge and application | 4 | 8 |
| a test | a lecture, | The role of agriculture in economic development | Knowledge and application | 4 | 9 |
| a test | a lecture, | Foundations of | Knowledge and | 4 | 10 |

| Infrastructure | |
|---|---|
| BooksScientific methodology in the field of specialization. | 1Required textbooks |
| • BooksSpecialized process. | 2Main references(Sources) |
| • General and specialized computer programs. | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| Curriculum Development Plan |
|---|
| Review of modern scientific literature<br>1- Participation in relevant scientific conferences<br>2- Dedicating the teaching and training staff to application and work<br>3- Hosting specialized professors<br>4- Scientific affiliation with other universities and similar colleges |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **252. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **253. the university/Scientific Department** |
| Field crop modeling**DES102** | **254. name/Course code** |
| | **255. The program(s) that youincomeIn itA** |
| 23- Weekly class schedule(Theoretical and practical).<br>24- Discussions, scientific seminars and other extracurricular activities | **256. Available attendance forms** |
| Decisions. | **257. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **258. Number of study hours(Total)** |
| //**2024**. | **259. Date this description was prepared** |

260. Course objectives

- Introduction to the FAO program and the calculation steps for estimating soil water storage and estimating growing days for vegetation. Program windows for plants, soil, irrigation, fertilization and agricultural operations. Implementation of the program simulation

261. Course outcomes, teaching, learning and assessment methods

د- Cognitive objectives

- Ability to identify water management elements in arid areas
- Study of plants and their relationship to the ecosystem and climate elements in arid regions
- Learn about the plant succession, climatic regions of Iraq and the types of environment in it.

for-**Course Skill Objectives**.

- It is formulated in a procedural form that is detailed, precise and specific. It

is related to the knowledge and skills to be taught during the lecture.

- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, report writing, conducting seminars, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- It is formulated in a procedural form that is detailed, precise and specific. It is related to the knowledge and skills to be taught during the lecture.
- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, self-paced learning, feedback, deductive and analytical reasoning questions, systematic laboratory training, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability and personal development).**

D1-Field visits to gain experience from others.

D2-Keeping up to date with scientific developments in the field of specialization(Educational videos).

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | **Introduction to the FAO ProgrammeAquacropIn simulating the response of productivity to irrigation water** | Knowledge and application | 4 | 1 |
| a test | a lecture | **Calculation steps for estimating soil water content and estimating growing days of vegetation** | Knowledge and application | 4 | 2 |
| a test | a lecture, | **Tensile properties of green vegetation** | Knowledge and application | 4 | 3 |
| a test | a lecture, | **Effect of plant growth and root spread** | Knowledge and application | 4 | 4 |
| a test | a lecture, | **Soil water-salinity balance and its relationship to plant water requirements** | Knowledge and application | 4 | 5 |
| a test | a lecture, | **Total above-soil plant production (straw + grain)** | Knowledge and application | 4 | 6 |
| a test | a lecture, | **Plant production information (vegetative and grain production)** | Knowledge and application | 4 | 7 |
| a test | a lecture, | **Implementation of the programAquacropHow to install it** | Knowledge and application | 4 | 8 |

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|---|---|---|---|---|---|
| a test | a lecture, | **Windows configured for running programs (climate window)** | Knowledge and application | 4 | 9 |
| a test | a lecture, | **(Plant Properties Window)** | Knowledge and application | 4 | 10 |
| a test | a lecture, | **Window (rain-fed and rain-fed crop production management)** | Knowledge and application | 4 | 11 |
| a test | a lecture, | **Field Operations Window (Fertilizers and Supplementary Operations)** | Knowledge and application | 4 | 12 |
| a test | a lecture, | **Field Soil Profile Properties Window** | Knowledge and application | 4 | 13 |
| a test | a lecture, | **Program simulation and initial limits** | Knowledge and application | 4 | 14 |
| a test | a lecture, | **Implement project simulations and compare them with real field data and outputs.** | Knowledge and application | 4 | 15 |

| Infrastructure | |
|---|---|
| BooksScientific methodology in the field of specialization. | 1Required textbooks |
| • BooksSpecialized process. | 2Main references(Sources) |
| • General and specialized computer programs. | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| Curriculum Development Plan |
|---|
| Review of modern scientific literature<br>1- Participation in relevant scientific conferences<br>2- Dedicating the teaching and training staff to application and work<br>3- Hosting specialized professors<br>4- Scientific affiliation with other universities and similar colleges |

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|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **262. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **263. the university/Scientific Department** |
| Animal production principlesDES152 | **264. name/Course code** |
| | **265. The program(s) that youincomeIn itA** |
| 25- Weekly class schedule(Theoretical and practical).<br>26- Discussions, scientific seminars and other extracurricular activities | **266. Available attendance forms** |
| Decisions. | **267. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **268. Number of study hours(Total)** |
| //**2024**. | **269. Date this description was prepared** |

270. Course objectives

- Identify the types of animals on the farm
- Study information related to animal husbandry
- The study of animals and their relationship to the ecosystem

271. Course outcomes, teaching, learning and assessment methods

- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
- Ability to communicate and inquire with the subject teacher
- Writing reports related to the subject matter after identifying the scientific sources available in the library on topics related to fertilizers and fertilization

for-**Course Skill Objectives**.

- It is formulated in a procedural form that is detailed, precise and specific. It

is related to the knowledge and skills to be taught during the lecture.

- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, report writing, conducting seminars, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- Students will be able to identify animals.
- Students will learn how to handle farm animals.
- It will enable students to know the distribution of farm animals.

**Teaching and learning methods**

Traditional lecture, self-study, feedback, deductive and analytical reasoning questions, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability and personal development).**

D1-Field visits to gain experience from others.

D2-Keeping up to date with scientific developments in the field of specialization(Educational videos).

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | Course introduction, learning objectives, course content | Knowledge and application | 4 | 1 |
| a test | a lecture | The economic importance of animal production and its role in agriculture | Knowledge and application | 4 | 2 |
| a test | a lecture, | Animal production in Iraq, reality and possibilities, problems, how to promote animal wealth in Iraq | Knowledge and application | 4 | 3 |
| a test | a lecture, | Origin of cows, position in the animal kingdom, global breeds of cows, Iraqi cows<br>Origin of sheep, global and local breeds of sheep and goats<br>The origin of buffalo, global and local breeds, general, physiological and reproductive characteristics, types of buffalo and their meat and milk production | Knowledge and application | 4 | 4 |
| a test | a lecture, | Factors affecting the productive efficiency of cows and sheep (genetic and environmental factors)<br>Origin of cows, position in the animal kingdom, global breeds of cows, Iraqi cows<br>Origin of sheep, global and local breeds of sheep and goats | Knowledge and application | 4 | 5 |

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|---|---|---|---|---|---|
| a test | a lecture, | The origin of buffalo, global and local breeds, general, physiological and reproductive characteristics, types of buffalo and their meat and milk production | Knowledge and application | 4 | 6 |
| a test | a lecture, | Factors affecting the productive efficiency of cows and sheep (genetic and environmental factors) | Knowledge and application | 4 | 7 |
| a test | a lecture, | Origin of cows, position in the animal kingdom, global breeds of cows, Iraqi cows | Knowledge and application | 4 | 8 |
| a test | a lecture, | The economic importance of the poultry industry<br>Types and breeds of laying, meat and dual-purpose chickens<br>Poultry Industry Projects (Hatchery, Poultry Farms, Stock and Parent Farms)<br>Chicken farming basics<br>poultry slaughterhouse design | Knowledge and application | 4 | 9 |
| a test | a lecture, | Fish environment.<br>The economic importance of the poultry industry | Knowledge and application | 4 | 10 |
| a test | a lecture, | | Knowledge and application | 4 | 11 |
| a test | a lecture, | Types and breeds of laying, meat and dual-purpose chickens<br>Poultry Industry Projects (Hatchery, Poultry Farms, Stock and Parent Farms) | Knowledge and application | 4 | 12 |
| a test | a lecture, | Chicken farming basics<br>poultry slaughterhouse design | Knowledge and application | 4 | 13 |

| | | | | | |
|---|---|---|---|---|---|
| a test | a lecture, | Turkey and waterfowl, the importance of breeds and the importance of production<br>Fish, types, classification, locations<br>Appearance and biological measurements of fish | Knowledge and application | 4 | 14 |
| a test | a lecture, | Turkey and waterfowl, the importance of breeds and the importance of production | Knowledge and application | 4 | 15 |

| Infrastructure | |
|---|---|
| BooksScientific methodology in the field of specialization. | 1Required textbooks |
| • BooksSpecialized process. | 2Main references(Sources) |
| • General and specialized computer programs. | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |

| Curriculum Development Plan |
|---|
| Review of modern scientific literature<br>1- Participation in relevant scientific conferences<br>2- Dedicating the teaching and training staff to application and work<br>3- Hosting specialized professors<br>4- Scientific affiliation with other universities and similar colleges |

| | |
|---|---|
| Ministry of Higher Education and Scientific Research /Northern Technical University | **272. Educational institution** |
| Agricultural Technical College Mosul/Technical departmentCombating desertification | **273. the university/Scientific Department** |
| Fruit production in desert areasDES206 | **274. name/Course code** |
| | **275. The program(s) that youincomeIn itA** |
| 27- Weekly class schedule(Theoretical and practical).<br>28- Discussions, scientific seminars and other extracurricular activities | **276. Available attendance forms** |
| Decisions. | **277. the chapter/Year** |
| 60 hour (Number of theoretical and practical hours during the 15 weeks) | **278. Number of study hours(Total)** |
| //**2024**. | **279. Date this description was prepared** |

280. Course objectives

- Students will be able to identify the suitable environment for fruit production in dry areas.
- Students will learn how to grow fruit trees in dry areas.
- Identify the types of fruits that can be produced in desert areas
- Study of information related to fruit cultivation in desert areas
- Study of fruit cultivation in dry areas and its relationship to the ecosystem

281. Course outcomes, teaching, learning and assessment methods

- The ability to discuss in a scientific spirit and express what he finds difficult in studying the subject.
- Ability to communicate and inquire with the subject teacher
- Writing reports related to the subject matter after identifying the scientific sources available in the library on topics related to fertilizers and fertilization

for-**Course Skill Objectives**.

- It is formulated in a procedural form that is detailed, precise and specific. It

is related to the knowledge and skills to be taught during the lecture.

- It determines the performance that the teacher seeks to achieve in the learner, the conditions for its occurrence, and the level of mastery required in the performance.
- That is, it causes a change in the learner's behavior.

**Teaching and learning methods**

Traditional lecture, report writing, conducting seminars, and summer training..

**Evaluation methods**

Daily written and oral tests, practical tests, seminars, midterm and final exams, assignment commitments, attendance and commitment, feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.) ,Reports on scientific developments in the field of specialization, asking analytical and inferential questions.

G-**Emotional and value goals**

- Before studying this subject, students are required to know the types of fruit-producing trees in desert areas.

**Teaching and learning methods**

Traditional lecture, self-study, feedback, deductive and analytical reasoning questions, and summer training..

**Evaluation methods**

Written, oral and practical tests, semester and final exams, daily tests, and commitments to assignments such as preparing reports in the field of specialization and then discussing the reports, attendance and commitment.,Feedback(Student test on previous topic) ,Self-assessment(Questions are asked to the student by the teacher, and the student answers the questions. The teacher also answers the same questions, and the student is asked to evaluate himself in light of the teacher's answers.)Questionsdeductive And the deductive.

D-**General and transferable skills(Other skills related to employability and personal development).**

D1-Field visits to gain experience from others.

D2-Keeping up to date with scientific developments in the field of specialization(Educational videos).

| Course structure | | | | | |
|---|---|---|---|---|---|
| **Evaluation method** | **Teaching method** | **Unit name/Or the subject** | **Required learning outcomes** | **Watches** | **The week** |
| a test | a lecture, | Course introduction, learning objectives, course content | Knowledge and application | 4 | 1 |
| a test | a lecture | **The importance of fruits and methods of their classification, the economic and nutritional importance of fruits, the theoretical foundations for establishing new orchards and ensuring the selection of the appropriate plot of land, preparation and preparation processes for cultivation** | Knowledge and application | 4 | 2 |
| a test | a lecture, | **Evergreen fruits suitable for dry areas**<br>**Palm trees/ habitat, distribution, economic and nutritional importance.**<br>**Olive/homeland, distribution, economic and nutritional importance. Environmental factors, soil factors, climate factors,** | Knowledge and application | 4 | 3 |
| a test | a lecture, | **The importance of fruits and methods of their classification, the economic and nutritional importance of fruits, the theoretical foundations for establishing new orchards and ensuring the selection of the appropriate plot of land, preparation and preparation processes for cultivation** | Knowledge and application | 4 | 4 |
| a test | a lecture, | **Evergreen fruits suitable for dry areas**<br>**Palm trees/ habitat, distribution, economic and** | Knowledge and application | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| | | **nutritional importance.**<br>**Palm trees/Environmental factors, soil factors, climate factors, service operations** | | | |
| a test | a lecture, | **Olive/homeland, distribution, economic and nutritional importance. Environmental factors, soil factors, climate factors,** | Knowledge and application | 4 | 6 |
| a test | a lecture, | **Olives/The phenomenon of floating, its causes, and ways to overcome it, service operations** | Knowledge and application | 4 | 7 |
| a test | a lecture, | **Buckthorn, prickly pear / habitat, spread, economic and nutritional importance, environmental factors, reproduction, varieties.** | Knowledge and application | 4 | 8 |
| a test | a lecture, | **Deciduous fruit suitable for dry areas**<br>**Grapes**Native habitat, economic importance and nutritional value, botanical classification, suitable environment | Knowledge and application | 4 | 9 |
| a test | a lecture, | **Almonds**Native habitat, nutritional value, economic importance, suitable environment, nature of pregnancy, reproduction, service operations, varieties | Knowledge and application | 4 | 10 |
| a test | a lecture, | **Pistachio**Native habitat, nutritional value, economic importance, suitable environment, nature of bearing, reproduction, service operations, flowering and pollination, varieties, | Knowledge and application | 4 | 11 |
| a test | a lecture, | **Pomegranate**Native habitat, nutritional value, | Knowledge and | 4 | 12 |

| | | | | | |
|---|---|---|---|---|---|
| | | economic importance, suitable environment, nature of pregnancy, reproduction, service operations, varieties. | application | | |
| a test | a lecture, | **Grapes**/ Reproduction, nature of pregnancy, methods of breeding and fruiting pruning | Knowledge and application | 4 | 13 |
| a test | a lecture, | **Deciduous fruit suitable for dry areas**<br>**Grapes**Native habitat, economic importance and nutritional value, botanical classification, suitable environment | Knowledge and application | 4 | 14 |
| a test | a lecture, | **Apricot**Native habitat, nutritional value, economic importance, suitable environment, nature of pregnancy, reproduction, service operations, varieties | Knowledge and application | 4 | 15 |

| **Infrastructure** | |
|---|---|
| BooksScientific methodology in the field of specialization. | 1Required textbooks |
| • BooksSpecialized process. | 2Main references(Sources) |
| • General and specialized computer programs. | A- Recommended books and references(Scientific journals,Reports,....) |
| | B - Electronic references,Websites.... |



| **Curriculum Development Plan** |
|---|
| Review of modern scientific literature |