



**Department of
Field Crops –
Faculty of
Agriculture**



**Faculty of
Agriculture,
Wasit University**

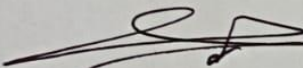


**وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي
قسم الاعتماد**

Field Crop Science Department Academic Program and Course Description Guide 2025–2026

Academic Program Description Form

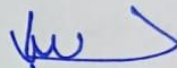
University Name: wasit
Faculty/Institute: Agriculture
Scientific Department: Field crops
Academic or Professional Program Name: Field crops
Final Certificate Name: Field crops
Academic System: Quarterly
Description Preparation Date: 2/11/2025
File Completion Date: 10/3/2026

Signature: 

Head of Department Name:

Prof. Mabil Raheem Lahmed

Date: 10/3/2026

Signature: 

Scientific Associate Name:

W. S. Anderson

Date: 10/3/2026

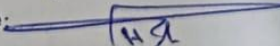
الاستاذ المساعد الدكتور
وسام سامي التميمي
معاون العميد للشؤون العلمية والدراسات العليا

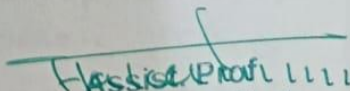
The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 10/3/2026 Hibat Allah A. Hussein

Signature: 


Dr. Hakeem S. Abed

Approval of the Dean

Introduction:

The academic program is a structured and organized package of courses that includes procedures and experiences organized into course content. Its primary purpose is to build and refine graduates' skills, making them qualified to meet the demands of the labor market. It is reviewed and evaluated annually through internal and external audit procedures and programs, such as the external examiner program.

The academic program description provides a concise summary of the program's main features and courses, outlining the skills students are designed to acquire, based on the program's objectives. The importance of this description lies in its role as the cornerstone for obtaining program accreditation. It is written collaboratively by faculty members under the supervision of the academic committees in the departments.

This second edition of the guide includes an updated academic program description, reflecting the changes and developments in the Iraqi education system. It includes the traditional academic program description (annual, semester-based), as well as the standardized academic program description issued by the Department of Studies, T M3/2906, dated May 3, 2023, for programs that follow the Bologna Process. In this regard, we cannot but emphasize the importance of writing descriptions of academic programs and courses to ensure the smooth running of the educational process.

Concepts and Terminology:

Academic Program Description: The academic program description provides a concise summary of its vision, mission, and objectives, including a precise description of the targeted learning outcomes according to specific learning strategies.

Course Description: This provides a concise summary of the course's key characteristics and the learning outcomes expected of the student, demonstrating whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious vision for the future of the academic program, aiming to be advanced, inspiring, motivating, realistic, and applicable.

Program Mission: This outlines the objectives and activities necessary to achieve them concisely, and defines the program's development paths and directions.

Program Objectives: These are statements describing what the academic program intends to achieve within a specific timeframe and are measurable and observable.

Curriculum Structure: All courses/studies included in the academic program, according to the approved learning system (semester, annual, Bologna Process), whether required by the Ministry, University, College, or Department, along with the number of credit hours.

Learning outcomes: A coherent set of knowledge, skills, and values acquired by the student upon successful completion of the academic program. Learning outcomes for each course must be defined in a way that achieves the program objectives.

Teaching and learning strategies: These are the strategies used by faculty members to enhance student teaching and learning. They are plans implemented to achieve learning objectives. In other words, they describe all classroom and

.extracurricular activities designed to achieve the program's learning outcomes

Programme Specification

Program Code 1:0	FS	ects are	240
The duration of the study is 4 years	4 levels, 8 semesters	Mode of Attendance:	I k)II

The Field Crops Department in the faculties of agriculture is one of the vital departments that focus on the study of strategic crops such as grains, legumes, oil crops and fibers, with the aim of achieving food security and sustainable agricultural development. This specialization is related to many agricultural and environmental sciences such as soil science, genetics, physiology, prevention and agricultural economics, in addition to modern technologies such as smart agriculture and genetic engineering. The department is based on solid scientific foundations that include the study of plant morphology and physiology, genetically improving crops and increasing their productivity and tolerance to environmental stresses, as well as managing agricultural systems such as crop rotation and conservation agriculture. It aims to prepare qualified cadres capable of developing the agricultural sector, increasing productivity and crop quality to keep pace with the needs of the local and global market, and promoting sustainable agriculture to preserve natural resources. It also contributes to scientific research that is concerned with solving the problems of the agricultural sector. The societal motivation to engage in this specialization comes from its direct link to food security and meeting the challenges of population growth, providing job opportunities in the agricultural and research sectors, and contributing to rural development and increasing the income of farmers. In the early stages, students study the basics of botany, soil, genetics and plant

production methods, while deepening in the advanced stages of managing Crops and their breeding, biotechnologies and combating environmental stresses, with the acquisition of practical skills in the management of agricultural projects and the use of modern technologies and data analysis to improve production, which qualifies graduates to work in ministries of agriculture, research centers, agricultural companies and international food organizations, or to establish special agricultural projects, or to continue graduate studies in the fields of biotechnologies, climate change and agricultural economy, thus becoming actors in achieving food and economic stability.

1. Program vision

Leading in promoting sustainable agriculture and agricultural innovation, by graduating qualified cadres capable of leading change in the agricultural sector, achieving food security, and preserving natural resources for future generations.”

2. Program's mission

- Preparing scientifically and practically qualified agricultural cadres to lead the agricultural sector.
- Providing high-quality education that enhances knowledge and skills in the field of crop science.
- Producing applied scientific research that contributes to solving agricultural challenges.
- Strengthen partnership with the community to support sustainable agricultural development.
- Contribute to achieving food security through the development of agricultural production.

3. Program objectives

1. Electronic United Nations

- Provide students with theoretical and practical knowledge in agricultural sciences and agricultural engineering.
- Enhance students' understanding of environmental and economic

challenges in the agricultural sector.

2. Developing practical skills:

- Develop students' skills in using modern technologies and managing agricultural resources.
- Strengthen capacity to design and implement sustainable agricultural projects.

3. Promoting ethical and professional values:

- Instilling the values of sustainability and social responsibility in students.
- Promote adherence to professional ethics in agricultural research and practice.

4. Scientific research and innovation.

- Encouraging students to participate in scientific research that contributes to solving agricultural problems.
- Support innovation in agriculture by providing a stimulating learning environment.

5. Community Service:

- Preparing graduates who are able to contribute to improving the quality of life in rural communities.
- Strengthening cooperation with the public and private sectors to achieve

food security.

6. Continuous development of academic programs:

- Updating the curriculum to comply with recent developments in agricultural sciences.
- Ensuring the quality of academic programs through continuous evaluation and improvement.

4. Programmatic accreditation

Is the program subject to programmatic accreditation? In which direction?
Seeks accreditation by 2027

5. Other External Impacts

Ministry of Higher Education and Scientific Research - Republic of Iraq

Is there a program sponsor? Opportunities for support
Government support in addition to joint cooperation with companies and the private sector

School curriculum

Academic Year	Level	Course Code	The name of course	Credit Hours		UNIT S
				Theoretical	Practical	
Third	5th	GENE311	Genetics.	2	3	3.00
		EXDA312	Experimental Design and Analysis	2	3	3.00
		SETE326	Seed Technology	2	3	3.00
		FICI314	Insect of Field Crops	2	3	3.00
		FOCR316	Fodder crops	2	3	1.00
		SAT317	Smart Agriculture Technology	2	3	3.00
		Total		12	18	16.00
	Sixth grade	FICR321	Fibre crops	2	3	3.00
		FICM322	Crop Machines	2	3	3.00
		LECR323	Legum Crops	2	3	3.00
		FICD324	Crop Pathogens	2	3	3.00
		BEBR325	Bee Breeding	2	3	3.00
		LARE315	land reclamation	2	3	3.00
		CECR313	Cereal Crops	2	3	3.00
		Total		14	21	21.00
Fourth	Seventh grade	DRPL411	Drug plants	2	3	3.00
		PLPH412	Plant Physiology	2	3	3.00
		WEBI413	Weed Biology	2	3	3.00
		PAMA424	Pasture management	2	3	3.00
		LACU415	Land cultivation	2	3	3.00
		MOGE416	Molecular Genetics	2	3	2.00
		REPR417	Graduation Research Project	-	3	1.00
		ENGL404	English	1	-	1.00
		Total		13	21	19.0
	Section	PLBR421	Plant Breeding	2	3	3.00
		PLGR422	Growth Regulators	2	3	3.00
		WECO423	Weed Control	2	3	3.00
		FICM414	Field Crops	2	3	3.00
		ECST425	Environmental stress	2	3	3.00
		SEM404	Seminars	1		1.00

		REPR427	Graduation Research Project	-	3	1.00
		Total		11	18	17.0

6. Program Structure				
Program Structure	Number of decisions	Unit of study	Percentage	Notes
Institutional requirements	4	8	7	Basic
College Requirements	5	15	13	Basic
Section Requirements	28	98	80	Basic
Summer Training	-	-	-	Basic
Other				

*** Notes can be included if the course is basic or optional.**

8. Anticipated learning outcomes for the program	
Knowledge	
Enabling students to have a good understanding of field crop management in line with the requirements of sustainable development and the need of the labor market	Learning objectives and competencies: Understanding the basics of agricultural science: - Understand basic concepts in field crop science , agronomy, and resource management. - Understand the relationship between the physical and chemical components of climate and plant growth. Practical Applications: - Learn how to apply scientific theories in solving complex agricultural problems. - Understand the impact of environmental and climatic factors on agricultural production. Understanding Modern Technologies:Knowledge of the use of modern technologies in agriculture such as smart irrigation systems and agricultural automation. - Understand the role of technology in improving agricultural productivity. Understanding Economic and Social Aspects: - Recognize the impact of agriculture on the local and global economy. - Understand the social role of agriculture in achieving food security
Skills:	
Practical skills and experience in managing agricultural fields in scientific and technical ways that contribute to increasing production and improving quality while maintaining the basic means of production (soil, water and air)	Analytical skills Data analysis and derivation of findings. Use analytical tools to assess production quality. Technical Skills Ability to manage agricultural fields and improve productivity and quality Ability to use modern agricultural equipment and agricultural techniques. Applying engineering principles in the design of diverse agricultural systems (irrigation, control , fertilization)

	3. Research Skills: • Ability to conduct scientific research in the field of agriculture and disseminate scientific recommendations • The ability to test and confirm scientific hypotheses and solve problems scientifically. 4. Communication Skills: • Ability to communicate effectively with agricultural teams and local communities. • Provide scientific presentations and technical reports in a clear and concise manner. • Contribute to community advisory and technical expertise. 5. Management skills • Attract and retain high-quality and motivated staff. • Planning and organization of agricultural projects.
Values	
Ethical and professional commitment to improving the quality of the rural community, serving the community and achieving food security	• Commitment to Sustainability • Promote sustainable farming practices that preserve the environment. • Commitment to using natural resources responsibly. Professional Ethics: • Adherence to ethical principles in scientific research and agricultural practice. • Respect for intellectual property rights in agriculture. Community Service: • Working to improve the quality of life in rural communities through the development of agriculture. • Contribute to achieving food security at the local and global levels. Collaboration and Teamwork: • Enhancing team spirit in agricultural and research work. • Respect different perspectives in solving agricultural problems.

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9. Teaching and Learning Strategies

- **Project-Based Learning:**

- Implementing practical agricultural projects aimed at solving real problems.
- Apply scientific theories in a practical environment.

Interactive learning:

- Use group discussions and workshops to enhance understanding.
- Interacting with experts in the agricultural field through lectures and seminars.

- **Self-Learning:**

- Encourage students to research and self-explore agricultural topics.
- Use electronic resources and libraries for continuous learning.

Experiential Learning:

- Conducting practical experiments in laboratories and agricultural fields.
- Analyze practical results and compare them with scientific theories.

Continuous assessment:

- Use formative assessments to continuously measure student progress.
- Provide immediate feedback to improve performance.

- **Collaboration with the Industry Sector:**

- Organizing field visits to farms and agricultural companies.
- Cooperating with the private sector in the implementation of research and applied projects.

10. Evaluation Methods

Theoretical Assessments:

- Written tests (short and quarterly).
- Research papers and technical reports.
- Presentations

Practical Assessments

- laboratory experiments
- Practical projects and field visit reports.

Skills Assessment

- Evaluate the use of agricultural tools and equipment.
- Self-assessment and peer assessment.

- Participation in panel discussions and workshops.

4. Values Assessment:

- Observe behavior during group work.
- Evaluate student participation in community service activities.

Comprehensive Assessments

- A cumulative assessment that includes theory and process.
- Project evaluation

6. Technology Assessments:

- Electronic tests.
- Simulation and evaluation of digital projects.

continuous Assessments

- Formative assessment (ongoing with feedback)
- Final Evaluation

8. External Values:

- Assessment by external experts.
- Recognized professional certifications.

9. Results-Based Assessments:

- Measuring learning outcomes (e.g. problem solving)
- Evaluating the impact of projects on the environment and society.

10. Personal Assessments:

11. Teaching staff					
Members of the teaching staff					
Preparing the teaching staff		Requirements / Skills Special (if any)	Specialization		Scientific Rank
	Owners		private	general.	Lecturer
	1	Experienced in hybridization methods and selection of varieties	Upbringing and improvement	Field crops	Professor ship
	I	Expert in Pest Management and Jungle Control	Fighting the jungle	Field crops	Professor
	I	Expert in technology transfer	Information Technology	Agricultural and educational extension	Assistant Professor
	1	Skilled in traditional pedagogy	Upbringing and improvement	Field crops	To become a teacher
	I	Expert in gene transfer methods	Botanical Techniques and Genetic Engineering	Horticulture & Garden Engineering	Assistant Professor
	I	I'm a lab technician.	Phosphorylation of plants	Field Crops	To become a teacher
	I	An expert in medicinal plants.	Medicinal Plants and Stress	Sixty years and engineering gardens	Assistant Professor
	1	social stability in rural communities.	Transfer information	Agricultural Extension Officer	Assistant Professor
	5		Production of crops	crops Field	Assistant Lecturer
	I		Food production	Food Science	To become a teacher

	1		Agronomic	Agronomic	Assistant Lecturer
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Career Development
Guiding the members of the new teaching staff
Urging the development of autonomous capabilities through continuous and effective participation in public and specialized courses and workshops focusing on self-development in the field of model management and guiding demand through reciprocal interaction in lectures
Professional development of teaching staff members
1. Training in modern technologies: • Courses in the use of modern agricultural technology (such as smart irrigation systems, precision agriculture). • Training on agricultural data analysis programs. 2. Teaching Skills: • Workshops on effective teaching strategies (active learning, formative assessment). • Training on curriculum design compliant with accreditation standards. Promoting scientific research. • Participation in conferences and research workshops. • Training on writing research papers and obtaining research funding. Continuing Education • Attend specialized courses in agricultural sciences and agricultural engineering. • Following up on recent developments in the agricultural field by reading and participating in seminars. 5. Cooperation with the industrial sector: • Field visits to modern companies and farms. • Partnerships with the private sector to develop research and applied projects. 6. Leadership and Management Development: • Courses in educational leadership and management of research teams. • Training on the management of major agricultural projects. Assessment and feedback • Evaluate the performance of teaching staff periodically.

- Provide feedback based on evaluation results to improve performance.

International Education

- Exchanging experiences with international universities through academic exchange programs.
 - Participation in international research projects
- **9. Promoting Ethical Values:**
- Workshops on the ethics of scientific research and professional practice.
- Promote awareness of the importance of sustainability and social responsibility.

Self-development

- Encourage staff members to follow developments in their disciplines independently.
- Providing educational resources (books, periodicals, online platforms) to support self-development.

12. Acceptance criterion

Central acceptance of morning studies according to the annual plan submitted by the college .

- **The student obtains a high school diploma (scientific department) at a rate not less than the minimum specified by the ministry or college. Or graduates of agricultural vocational preparations**
- **The student shows a real desire to study agricultural sciences.**
- **Determine the number of students in the annual plan according to the material and human resources and infrastructure of the college and the department**
- **Determine the annual numbers according to the needs of the market and service institutions according to the policy of the department and cooperation with employers**

Direct submission of evening studies – by rate and competition

13. The most important sources of information about the program

The Central Library at the University and the College
Theses, theses and scientific research
Internet and Websites
Personal libraries for teaching staff

14. Program Development Plan

The development plan focuses on improving curricula, enhancing scientific research, developing teaching staff, and serving the community, while adhering to quality standards and academic accreditation. They include:

Curriculum development

- **Updating the scientific content to comply with recent developments in agricultural sciences.**
- **Adding new courses focusing on modern technologies such as smart agriculture and sustainability.**
- **Promote integration between theory and practice in curricula.**

2. Improving the learning environment:

- **Equipping laboratories with the latest devices and technologies.**
- **Providing classrooms equipped with modern teaching technologies (such as smart boards).**
- **Establishing model educational farms for practical training.**

3. Developing teaching staff:

- **Organizing training courses for faculty members in the field of agricultural technology and effective teaching.**
- **Encourage faculty members to participate in international conferences and workshops.**
- **Provide opportunities for continuing education and advanced professional certifications.**

Promoting scientific research.

- **Provide research grants to support faculty and student projects.**
- **Establish partnerships with international research centers and universities.**
- **Encouraging the publication of research in refereed scientific journals.**

5. Improving support services for students:

- **Provide effective academic and career counseling programs.**
- **Establishing an electronic library that provides modern educational resources.**

- Provide financial support for outstanding students and students with special needs.

6. Strengthening cooperation with the industrial sector

- Partnerships with agricultural companies to provide practical training opportunities for students.
- Organizing field visits to farms and agricultural companies.
- Hosting experts from the industrial sector to deliver lectures and workshops.

7. Developing the evaluation system:

- Developing various evaluation tools (tests, projects, presentations).
- Introduce formative assessment to continuously measure student progress.
- Use of technology in assessment (e.g. electronic tests).

Enhance Scope of Community Service

- Organizing agricultural awareness campaigns for the local community.
- Providing scientific advice to farmers and agricultural companies.
- Implementing community projects that contribute to improving agricultural production.

QA & Accreditation

- Conduct periodic self-assessment of the program in accordance with the accreditation criteria.
- Apply recommendations of external assessment teams to improve quality.
- Update program policies and procedures on an ongoing basis.

Continuous Improvement:

- Review the development plan annually to assess progress and make improvements.
- Encouraging the participation of students and faculty members in the development process.

Program Skills outline															
				Required Program Learning Outcomes											
Y e a r/	Course Code	Course Name	Basic or Optio nal	Knowledge				Skills				Ethics			
Third Year/ Level1			Basic	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
	GENE311	Genetics.	Core				√		√		√	√			
	EXDA312	Experimental Design and Analysis	Core		√				√	√	√				√
	SETE326	Seed Technology	Core				√				√			√	√
	FICI314	Insect of Field Crops	Core			√	√		√	√	√	√	√		
	FOCR316	Fodder crops	Core			√				√		√			
	SAT317	Smart Agriculture Tecnology	Core		√	√	√		√	√	√	√		√	√
Third Year/ Level2	FICR321	Fibre crops	Core		√		√		√		√	√		√	√
	FICM322	Crop Machines	Core		√		√		√			√	√		
	LECR323	Legum Crops	Core				√				√				√
	FICD324	Crop Pathogens	Core				√		√					√	√

	BEBR325	Bee Breeding	Core		√				√	√	√	√			
	LARE315	land reclamation	Core		√	√	√		√	√	√				√
	CECR313	Cereal Crops	Core												
Fourth Year/ Level1	DRPL411	Drug plants	Core			√				√	√			√	
	PLPH412	Plant Physiology	Core									√		√	√
	WEBI413	Weed Biology	Core			√	√	√		√	√	√			
	PAMA424	Pasture management	Core					√		√		√	√		
	LACU415	Land cultivation	Core			√				√		√	√		
	MOGE416	Molecular Genetics	Core			√	√	√		√		√	√	√	√
	REPR417	Graduation Research Project	Core					√		√		√	√		
Fourth Year/ Level2	PLBR421	Plant Breeding	Core		√	√	√		√					√	√
	PLGR422	Growth Regulators	Core			√			√		√	√		√	√
	WECO423	Weed Control	Core			√	√		√		√	√		√	√
	FICM414	Field Crops	Core			√	√		√		√	√			√
	ECST425	Environmental stress	Core		√				√		√	√			√
	SEM404	Seminars	Core		√	√	√		√		√	√		√	√
	REPR427	Graduation Research Project	Core		√	√	√		√		√	√		√	√

Please indicate in the corresponding quadrants the individual learning outcomes from the assessed programme

THIRD STAGE

FIELD CROPS DEPARTMENT

SEMESTERS

Course Description1

1. Name of the course					
Plant Gentic					
2. Course Code					
GENE311					
3. Term/ Year					
Semester /school year 2025-2026.					
4. The date of preparation of this description					
2025-2026					
5. Available attendance forms					
My attendance: theoretical lectures and practical lessons, with the possibility of using blended learning when needed.					
6. Number of school hours (total/(number of units)total(					
60 hours during the semester: 5 hours per week, 2 theoretical + 3 practical, and the number of units 3 according to the approved plan.					
7. Name of the course officer (if more than one name is mentioned)					
Prof. Dr. Naseer Fahim Yasser Prof. Dr. Nada Mohammed Saadoune					
8. Course Objectives					
Enabling the student to understand the basics of plant inheritance and its relationship to improving field crops, and applying Mendel's laws in explaining the transfer of traits. The course also aims to train the student to analyze the results of hybridization and genetic probabilities, and to identify quantitative inheritance, clan inheritance and molecular markers and their applications in breeding and selection programs.					اهداف المادة الدراسية Course Objectives
9. Teaching and Learning Strategies					
Teaching and learning methods are based on interactive lecture, genetic problem solving, classroom discussion, and practical application. Assignments, reports, and quizzes are used to measure understanding and relate concepts to examples from field crops.					STRATEGIES &
10. Course Structure					
Assessmen	Learning	Name of the unit	Learning outcomes	Hours	Week

Method	Method	or subject			
Questions	Lecture	Introduction to Plant Genetics	Knows the concepts of Genetics and variation.	2	1
Test	Lecture and work	Cellular Basis of Inheritance	Explains the role of chromosomes.	2	2
school work, ought, duty, onus, must, task, trust, imperative, obligation, office	Solving mathematical problems	Mendel's First Law	Analyzes single hybridization.	2	3
Test	Exercises	Mendel's Second Law	Analyzes binary hybridization.	2	4
Questions	Lecture	Sovereignty and Multiple Alleles	explains non-Mendelian inheritance.	2	5
Home work,	Discussion	gene interaction	gene interaction	2	6
Test	Applications	Correlation and Genetic Maps	Calculates transit ratios.	2	7
Sess.	exam	Quarterly Examination and Cytoplasmic Inheritance	characterizes cytoplasmic inheritance.	2	8
storage	Analysis	Quantitative Inheritance	Interprets quantitative qualities.	2	9
school work,	Accounts	Clan Inheritance	Calculates the frequencies of alleles.	2	10
Test	Lecture	Chromosomal mutations and changes	Shows the impact of mutations.	2	11
Questions	Plans	Molecular Basis of Inheritance	Binds DNA to adjective expression.	2	12
Submit	Study	Molecular markers	Demonstrates the importance of tags.	2	13
school work,	Applications	Genetic Diversity	Associates heredity with plant breeding.	2	14

Test	Review	Review and Apps	Reviews key concepts.	2	15
11. Evaluation of the decision					
The score is distributed from: 15 marks for the first semester, 15 marks for the second semester , 5 marks for reports, assignments and participation, 20 marks for the practical part and 50 marks for the final exam.					
12. Sources of Learning and Teaching					
: Introduction to Genetic Analysis; Concepts of Genetics.			الكتب المنهجية - 1		
Principles of Plant Genetics and Breeding.			Key references		
: Lecturer's Notes and Recent References in Plant Inheritance.			Helpful References		

Course Description 1 Practical

1. Name of the course
Plant Genetic /Practical Part
2. Course Code
GENE311
3. Term/ Year
Semester /school year 2025-2026.
4. The date of preparation of this description
2025-2026
5. Available attendance forms
My presence in the laboratory: experiments, practical exercises and discussions, while adhering to laboratory safety instructions.
6. Number of school hours (total/(number of units)total(
45 laboratory hours during the semester: three hours per week for 15 weeks, and the units are fixed according to the approved plan.
7. Name of the course officer (if more than one name is mentioned)
Prof. Dr. Nada Mohammed Saadoun

8. Course Objectives					
Enabling the student to apply genetic concepts in practice by observing cell division, analyzing the results of hybridization, and calculating genetic ratios and probabilities. The laboratory part also aims to train the student to organize genetic data, draw simple maps, and write scientific reports related to plant inheritance.				Objectives	
9. Teaching and Learning Strategies					
Teaching and learning methods are based on hands-on demonstration, in-vitro teamwork, genetic exercise solution, and virtual or field data analysis. Student learning is measured through laboratory reports, quizzes, participation, and practical examination.				Strategies	
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning outcomes	Hours	Week
Questions	demo	Laboratory Safety and Genetics Tools	Recognizes business rules.	2	1
storage	Microscope	Screening for Phytomitosis	characterizes the phases of division.	2	2
Test	Integrated circuit	Meiosis and gametogenesis	Associates division with heredity.	2	3
school work	Views	Observe variation in traits	Record vegetarian qualities.	2	4
Test	Solving mathematical problems	Single hybridization exercises	analyzes our spelling monolithically.	2	5
school work,	Exercises	Binary hybridization exercises	Calculate binary ratios.	2	6
Test	Applications	Banet Square and Odds	Punnet Square	2	7
Sess.	exam	PRACTICAL EXAMINATION	Completes a practical test.	2	8
storage	Accounts	Genetic Chi-squared test	Tests the proportions matching.	2	9

school work,	Analysis	Genetic Correlation and Transmission	explains the genetic correlation.	2	10
Test	Exercise	North and Central America	Simple Map	2	11
Questions	Forms	Observations of mutations and changes	Identifies mutations morphologically.	2	12
storage	Adv.	Analyze quantitative qualities data	Quantitative traits	2	13
Submit	Discussion	Writing the laboratory report and presenting the results	Displays the results of an experiment.	2	14
Test	Review	Inclusive process	Practical Skills	2	15

11. Evaluation of the decision

Distribution of the laboratory part score: laboratory reports, short tests, participation and commitment, and a final practical exam within the accredited pursuit and final score.

12. Sources of Learning and Teaching

Plant Genetics Laboratory Manual and Lecturer's Notes.	الكتب المنهجية - 1
Principles of Plant Genetics and Breeding; Concepts of Genetics.	Key References for Conclusion:
Recent worksheets, practical exercises, and references in plant inheritance.	Auxiliary References:

Course Description Sample 2

1. Name of the course	
Design and analysis of agricultural experiments	
2. Course Code	
EXDA312	
3. Term/ Year	
Level 1 One/Third stage (2025-2026)	
4. The date of preparation of this description	
2025-2026	
5. Available attendance forms	
Full time attendance	
6. Number of school hours (total/(number of units)total(	
5 hours per week 2) theoretical hours 3+ operational hours (3.5-unit	
7. Name of the course officer (if more than one name is mentioned)	
Prof. Dr. Nabil Rahim Lahmoud Eng. Moataz Abdul Kazem Shaker	
8. Course Objectives	
• Introduction to General Concepts of Statistics • General Concept of Agricultural Experimental Design- • Types of designs, their importance and how to choose the appropriate for each trial • The important and important labor experience in the agricultural trade and the study of • Intervention Effects • Important Statistical Tests	Objectives of the Course
9. Teaching and Learning Strategies	
Project-Based Learning: Students design an integrated agricultural experience (such as choosing the best type of fertilizer), follow it in the greenhouse or field, then collect data, analyze it statistically, and write a final report. Problem-Based Learning: Presenting real agricultural problems (such as reduced productivity of a particular crop), and assigning students to design a statistical experiment capable of identifying the causes and solving the problem. Practical & Software-Based Learning: Train students to use modern	Strategy

statistical software (such as SPSS, SAS, or R language) to analyze agricultural experiment data rather than relying entirely on a complex manual solution.

Cooperative Learning: Dividing students into small groups to work together in implementing different experimental designs (e.g. RCBD or Latin square), which promotes the exchange of analytical skills.

Flipped Classroom: Students watch videos explaining the theoretical aspect of statistical designs at home, and lecture time is devoted to practical application, discussing the results and interpreting them agriculturally.

10. Course Structure

Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Lecture on a blackboard	Lecture	Introduction to Statistics	Knows the statistics and determines my importance	2	1
Wietboord Lecture	Lecture	Measurements of dispersion and concentration	Distinguish between types of measurements	2	2
In-person lecture	Lecture	Introduction to Experimental Design Agriculture	Knows the design, treatment, processor and worker	2	3
Lecture Field application	Lecture	Complete Random Design (Applications)	Distributes transactions by design. Analyzes data by design	2	4
Lecture and solving classroom problems	Lecture	Suggested tests after Experiment	Tests data by LSD, Duncan and Toki	2	5
Lecture	Lecture	First Examination Month	Student Evaluates	2	6
Lecture Field application		Designing random sectors Complete	The design is implemented on the ground . Analyzes data	2	7
Lecture Homework	Lecture	Relative efficiency of overall random sector design compared to random design Full Name	Estimates relative efficiency and compares designs in terms of efficiency	2	8

Lecture Field application	Lecture	Latin Square Design	Performs an experiment with a Latin square design. Analyzes data for design	2	9
Lecture Field application	Lecture	Factor experiments Factor experiments with CRD design	Distinguish between a general experience and a simple one.	2	10
Lecture Field application	Lecture	RCBD Factor Experiments	Applies a working experiment designed by RCBD and analyzes its data	2	11
Lecture Field application	Lecture	Factorial Experiences with Latin Square Design	Applies a working experiment to the design of the Latin square and analyzes its data	2	12
Lecture Field application	Lecture	Split boards	Distinguish between factual and dissociative experiences. Determines the reason for the use of splinter experiments	2	13
Lecture Field application	Lecture	Split Slabs	Performs a multi-factor experiment with the design of splinter boards. Distinguish between secondary and primary panels	2	14
In-Person		Second Month Examination		2	15

11. Evaluation of the decision

Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations
Editorial and reporting ... Etc.

12. Sources of Learning and Teaching

Designing and analyzing agricultural experiences	Required decision books (methodology, if any)
Principles of Statistics	Main references (sources)

Statistical procedures for agricultural research	Supporting books and references that are recommended in the journals Scientific, Reports (...)
Multiple sources related to the design and analysis of the experience	Online References, Internet Sites

Study of

1. Course Name:
Seed technology
2. Course Code
SETE326
3. Term: Quarterly/ Year : (2025-2026)
Chapter One/Phase Three
4. Date of preparation of this description:
2025-2026
5. Available attendance forms:
Full time attendance
Number of Hours and Units
5 hours (2 theoretical + 3 practical) / number of units (total) 3
7. Name of the course officer (if more than one name is mentioned)
Ed. Riyadh Jabbar Mansour Eng. Wamid Majeed Ali
Providing the student with practical and theoretical information to know the environmental and agricultural requirements of cereal crops.8 Objectives of the course - To enable the application of the scientific foundations for the management of cultivated fields in field crops

The student of science is primarily required to specialize in field fields Teaching the student for future work in the relevant ministries and institutions By taking goodcareofscience Prepare two scientific researchers and confirmations in the fieldof field crop management			اهداف المادة الدراسية		
9. Teaching and Learning Strategies					
1- Working to produce the application with concepts in the field of producing seeds in a good way 2- Defining the application by the types of crops, the nature of their growth, the way of their propagation, their reproduction, and their growth rates and harvesters. 3- The definition of the student in the nature of dealing with seeds used in agriculture in the field of crop production. 4- Defining the application by the laboratory equipment used in seed examination			Strategy		
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning outcomes	Hours	Week
Reviews	Lecture	Introduction to seed technology, and the importance of good seed in agricultural production.	Understand the importance of seeds as a primary input into agricultural production.	2	1
You are on my side, aren't you?	Lecture + Discussion	Seed formation, its internal structure, and the stages of development and physiological maturation.	Identify the anatomical structure and stages of seed growth.	2	2
Quizzes	Face-to-face lecture + group discussion	Seed germination, necessary environmental conditions, and physiological and chemical changes.	Understand the mechanisms of germination and the factors affecting it.	2	3
GENERAL QUESTIONS	Lecture	Seed stillness (primary and secondary), its causes, and the scientific methods for breaking it.	Diagnosis of dormant states and application of methods of breaking them in practice.	2	4

Discussion of a report	Lecture + Discussion	The vitality and strength of the seeds, and methods of measuring them (tetrazolium test and electrical conductivity).	Ability to conduct laboratory tests to assess vitality.	2	5
	Face-to-face lecture + group discussion	Production of seeds of self-pollinated and mixed crops.	Distinguish between seed production methods according to the nature of pollination.	2	6
Assessment Method		Midterm Exam.	Assess the student's understanding of previous vocabulary.	2	7
Reviews	Lecture	Rank the seeds (breeder, foundation, registered, approved) and the conditions for their production.	Understand the hierarchy of seed ranks and the criteria for each rank.	2	8
Assessment Method	Lecture + Discussion	Seed harvesting and drying, and the effect of moisture and heat on quality.	Determine the optimal dates and methods for harvesting and drying.	2	9
Quizzes	Face-to-face lecture + group discussion	Cleaning, grading and treatment of seeds (chemical and physical treatments).	Apply cleaning techniques and preventive treatments for seeds.	2	10
GENERAL QUESTIONS	Lecture	Store seeds, types of stores, and factors affecting vitality during storage.	Manage warehouses and provide optimal conditions for seed preservation.	2	11
Discussion of a report	Lecture + Discussion	Seed inspection and certification, sampling methods, and purity inspection.	Practice formal inspection and certification procedures.	2	12
Written Evaluation	Face-to-face lecture + group discussion	Degradation and aging of seeds, and factors causing degradation.	Identify the reasons for the decline in seed quality over time.	2	13
competition direct	Lecture	Domestic and international seed laws and regulations (e.g. ISTA rules).	Familiarity with the legal framework governing the trade and production of	2	14

			seeds.		
		A thorough review of the vocabulary, and a final practical evaluation.	Consolidate information and prepare for the final exam.	2	15
11. Evaluation of the decision					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations Editorial and reporting ... Etc.					
12. Learning and Training References					
Yok			Required textbooks (methodology if any)		
Seed technology. Riyad Jabbar Mansour and others 2024			Other References		
			Supporting books and references that are recommended in the journals Scientific, Reports (...)		
			E-mail and internet, what is the impact of the Internet		

1. Course Name:
Practical Seed Technology
2. Course Code
SETE326
3. Term: Quarterly/ Year : (2025-2026)
Chapter One/Phase Three
4. Date of preparation of this description:
2025-2026
5. Available attendance forms:
Full time attendance
Number of Hours and Units

5 hours (2 theoretical + 3 practical) / number of units (total) 3
7. Name of the course officer (if more than one name is mentioned)
Ed. Riyadh Jabbar Mansour Eng. Wamid Majeed Ali
Providing the student with practical and theoretical information to know the environmental and agricultural requirements of cereal crops.8 Objectives of the course - To enable the application of the scientific foundations for the management of cultivated fields in field crops
The main objectives of the practical seed technology course are five basic objectives that qualify the student directly for the labor market: • 1. Mastering vital quality tests: Practical ability to measure the proportion and speed of germination, and estimate the vitality of seeds (such as tetrazolium testing). • 2. Fine Seed Phenotyping: Gain the skill of instant identification of seeds of different crops and identification of weed seeds and foreign substances mixed with them (purity test). • 3. Measuring and managing seed moisture: Training on devices and scientific methods for estimating moisture content to determine the suitability of seeds for safe storage without degradation. • 4. Application of dormancy and activation break coefficients: Practice mechanical and chemical methods to break seed dormancy and stimulate it to ensure rapid and homogeneous germination in the field. • 5. Sampling and issuing quality certificates: Training on legal and technical methods for drawing representative samples from shipments, and preparing laboratory reports for seed approval and certification.
9. Teaching and Learning Strategies
Preferred to rely on educational strategies that focus on direct practice and problem solving, which are summarized in five short strategies: • 1. Hands-on Learning: Direct individual application for each student to perform germination, purity, and hygrometry tests using laboratory devices and instruments. • 2. Problem-Based Learning: Providing students with “anonymous samples” or “degraded seeds,” tasking them with diagnosing the problem (such as determining the reason for not germinating or the type of cheating) and providing solutions. • 3. Field Trips and Visits: Organize scientific visits to seed sifting and processing stations, grain silos and silos, and national testing laboratories to see industrial processes on the ground. • 4. Collaborative Learning: Dividing students into small working groups to run a “micro-project,” such as tracking the vitality of seeds stored under different conditions and writing a joint quality report. • 5. Simulation and Interactive Simulation: The use of explanatory videos and interactive programs to explain the mechanisms of work of large machines (such as separation screens and packing factories) that are difficult to provide within the university laboratory.

10. Course Structure

Assessment Method	Learning Method	Name of the unit or subject	Learning outcomes	Hours	Week
Reviews	Display screen	Diagnosis and identification of seeds : their forms , weaknesses , and sizes , waysto spread them	Distinguish between seed types	3	I
Quizzes	Laboratory equipment	Sampling	Can draw representative samples	3	2
Quizzes	Display screen	Purity Testing	Tests seed purity	3	3
GENERAL QUESTIONS	Laboratory equipment	Numerical examination of seeds Announcements	Examine seed samples	3	4
Discussion of a report	Display screen	First Month Examination		3	5
	Laboratory equipment	Cleanliness check	impurities	3	6
Assessment Method	Display screen	Seed biology test) Nitrazolium(	Tests seed vitality	3	7
Reviews	Laboratory equipment	Testing the strength of statements	Tests the power of seeders	3	8
Quizzes	Display screen	Testing the moisture content	Tests moisture content	3	9
Quizzes	Laboratory	Seed Certification	Knows certified seeds	3	10

	equipment				
GENERAL QUESTIONS	Display screen	Field Investigation	Applies on-site inspection	3	11
Discussion of a report	Laboratory equipment	Scientific visit to the Public Authority for Examination and Certification laboratories Seeds	Discusses seed vitality testing methods	3	12
Written Evaluation	Laboratory instruments	Estimating the ability of seeds to hibernate	Detects seed dormancy	3	13
competition direct	Laboratory instruments	Jungle seed hibernation test	Tests varieties of bush seeds	3	14
		Second Quarterly Examination		3	15

11. Evaluation of the decision

Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations
Editorial and reporting ... Etc.

12. Learning and Training References

Seeds of field crops)d. ‘Abd Qāsim al-Fakhrī(	Required decision books (methodology, if any)
Practical seed technology. Dr. Riyadh Jabbar Mansour and others 2023	Main references (sources)
There is no	Supporting books and references that are recommended in the journals Scientific, Reports (...)

نموذج وصف المقرر

1. Course Name					
Crop Insects					
2. Course Code					
FICI314					
3. Semester/year					
Spring/ Fourth					
4. Date this description was prepared					
2026 3/ 3 / 1					
5. Available attendance forms					
On a weekly basis					
6. Number of Credit Hours (Total) / Number of Units (Total): 2 Hours weekly 2 units					
30 hours/ 3.5 credits					
7. Course Administrator's Name					
Name: Prof. Dr. Hassanein Taher Karim + Dr. Hassan Hadi Faraj Email : Halhachami@uowasit.edu.iq					
8. Course Objectives					
*Identify the types of economic insects and the nature of the damage					
* Learn about economic pest control methods					
9. TEACHING AND LEARNING STRATEGIES					
1- Delivering lectures by asking questions and discussing them with students					
2- Using visual teaching aids such as show data					
3- Microscopic examination of the insect's body devices, their anatomy and identification of their structure .					
4- Displaying models of the insect's internal devices and drawing or photographing them by students.					
5- Conducting field tours for the purpose of collecting insects from fields or houses .					
6- Self-search for knowledge through home activity.					
10. Course Structure					
WE EK	Hours	Intended Learning Outcomes	Module / Course Name or	method of learning	Valuation method
1	5	Introduction	The importance of science and its association with other sciences	Lecture + Practical	Quizzes
2	5	Economic importance	on crops and the reasons for the increase and the most important economic pests	Lecture Practical	Quizzes
3	5	Multifamilial insects	Aphid /Diagnosis /Harm /Life Cycle and Control Methods	Lecture Practical	Quizzes
4	5	Multifamilial insects	Locust/Diagnosis /Damage/Life Cycle and Control Methods	Lecture Practical	Practical
5	5	Insect	Families/their importance /	Lecture +	Quizzes

		Overview Economic	damage /spread /Their reproduction, combating them previously and modern methods	Practical	
6	5	Wheat and barley pests	Rank/ morphology /deleterious phase/nature of damage/ Dispersion/ Prevention and Control	Lecture Practical	Practical EXAM
7	5	Corn and reed lesions	Rank/ morphology /deleterious phase/nature of damage/ Dispersion/ Prevention and Control	Lecture Practical	Quizzes
8	5	Sugar beet pests	Rank/ morphology /deleterious phase/nature of damage /Dispersion/ Prevention and control	Lecture Practical	Quizzes
9	5	Legumes	Rank/ morphology /deleterious phase/nature of damage /Dispersion/ Prevention and control	Lecture + Practical	Quizzes
10	5	Sunflower	Rank/ morphology /deleterious phase/nature of damage/ Dispersion/ Prevention and Control	Lecture Practical	Practical exam
11	5	Al Semsam	Rank/ morphology /deleterious phase/nature of damage /Dispersion/ Prevention and control	Lecture Practical	Quizzes
12	5	Tobacco and ladder pests	Rank/ morphology /deleterious phase/nature of damage/ Dispersion/ Prevention and Control	Lecture Practical	Quizzes
13	5	Intruder pests	Rank/ morphology /deleterious phase/nature of damage /Dispersion/ Prevention and control	Lecture + Practical	Quizzes
14	5	Modern Ways to Combat Pests	Linking hormones and pheromones plant extracts and their effect on Internal organs or sensory receivers	Lecture Practical	Quizzes

15	5	Chemical Pesticides	Impact on insects and according to the method of exposure	Lecture Practical	Quizzes
11. Course Evaluation					
Distribution of the score of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly and written examinations and reports etc.					
12. Learning and Teaching Resources					
Required textbooks (methodology if any)			Al-Azzawi Abdullah Fuleih and Ibrahim Qaddouri Qaddou,Haider Saleh 1990 Zarzis ,Salem Jameel and Hamza Kazem Abees 2000		
Key References (Sources)					
المجلات) بها يوصى التي الساندة والمراجع ب التقارير العلمية....			Theses and dissertations of Iraqi universities/scientific journals Iraqi Academy		
E-References , Websites			Journal of Insect physiology		

Course Description

1. Name of the course
Forage Crops
2. Course Code
FOCR316
3. Term/ Year
Chapter One/Phase Three (2025-2026)
4. The date of preparation of this description
2025–26
5. Available attendance forms
Full time attendance
6. Number of school hours (total/(number of units)total(
5 hours per week 2) theoretical hours 3+ operational hours (3.5-unit
7. Name of the course officer (if more than one name is mentioned)
Prof. Dr. Hakeem Sultan Abdul Eng. Hadeel Hamza Ali
8. Course Objectives

- Identify the types of feedstocks used in animal feeding - Types of these crops and their division into virginity and virginity - To know about the cultivation of wildlife and its role in maintaining the soil and increasing the yield - Identify the types of rangelands that exist in Iraq	Objectives of the Course
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9. Teaching and Learning Strategies

The most important strategies suitable for the course: 1. Field-Based Learning: Transferring the lecture to the educational field to enable students to distinguish fodder crops (grass and legume) in their different stages of growth, and to practice service, irrigation and fertilization operations themselves. 2. Inquiry-Based Learning: Assign students to calculate the productivity of green fodder and dry matter per square meter, and determine the optimal date for harvesting based on the balance between the quantity of the crop and its nutritional value. 3. Laboratory Analysis: Training students in the laboratory on methods of estimating the nutritional value of feed, such as measuring the percentage of fiber, raw protein, and moisture, to assess the quality of the resulting feed. 4. Applied projects for conservation operations (Project-Based Learning): Assigning students with mini-projects to manufacture silage or Hay in small quantities, and following up the stages of fermentation and corruption to learn the correct preservation methods without loss. 5. Field visits and simulation of reality (Field Trips): Organizing periodic visits to concentrated fodder factories, large cattle or sheep production projects, and natural pasture stations to link plant production with animal consumption.	Strategy
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10. Course Structure

Assessment Method	Learning Method	Name of the unit or subject	Outputs UNTRANSLATED_CONTENT_STARTTNUتعليمRANSLATED_CONTENT_END	Hours	Week
Daily Quizzes Semi-Quarterly Tests	Lecture	Terms and Definitions	Some jargons:	2	1

Daily Quizzes Semi-Quarterly Tests	Lecture	The Importance of the Highlights in Agricultural Cycles Maintenance of the soil	Explains the importance of fodder crops	2	2
Daily Quizzes Semi-Quarterly Tests	Lecture	Importance of Pulse Oil	Distinguish between types of fodder crops	2	3
Daily Quizzes Semi-Quarterly Tests	Lecture	Ghetto product	Diagnose types of jets and methods of cultivation	2	4
Daily Quizzes Semi-Quarterly Tests	Lecture	Produce of Egyptian Barsim	Distinguishes between its types and identifies its needs	2	5
Daily Quizzes Semi-Quarterly Tests	Lecture	Sweet parsley and soya beans	Distinguish between types of clover	2	6
		First Month Examination		2	7
Daily Quizzes Semi-Quarterly Tests	Lecture	Significance of end-products Producer of barley	Determines the types of grass fodder	2	8
Daily Quizzes Semi-Quarterly Tests	Lecture	Chauvin product	Diagnose types of oats	2	9
Daily Quizzes Semi-Quarterly Tests	Lecture	The yield of the yellow and white maize	Applies crop service processes	2	10
Daily Quizzes Semi-Quarterly Tests	Lecture	Sudanese visceral and millet product	Distinguish it from white corn	2	11

Daily Quizzes Semi-Quarterly Tests	Lecture	Key Takeaways	Defines feed mixtures	2	12
Daily Quizzes Semi-Quarterly Tests	Lecture	Rangelands and their varieties	Enumerates the types of rangelands	2	13
Daily Quizzes Semi-Quarterly Tests	Lecture	Method of estimating the state of the natural pasture	Estimates pasture condition	2	14
		Second Month Examination		2	15

11. Evaluation of the decision

Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations
Editorial and reporting ... Etc.

12. Sources of Learning and Teaching

Feed and pasture crops, Doctor: Ramadin Ahmed	Required decision books (methodology, if any)
Agriculture and Fodder Exploitation, Doctor: Mahdi Abdellatif	Main references (sources)
Scientific Jurisprudence and Reports	Supporting books and references that are recommended in the journals Scientific, Reports (...)
Some researches and articles on the topics of fodder	Online References, Internet Sites

1. Name of the course

Forage Crops Practical

2. Course Code

FOCR316	
3. Term/ Year	
Chapter 1/Phase 3 2025-2026	
4. The date of preparation of this description	
2025–26	
5. Available attendance forms	
Full time attendance	
6. Number of school hours (total/(number of units)total(	
5 hours per week 2) theoretical hours 3+ operational hours (3.5-unit	
7. Name of the course officer (if more than one name is mentioned)	
Prof. Dr. Hakeem Sultan Abdul Eng. Hadeel Hamza Ali	
8. Course Objectives	
1. Knowledge of the most important topics - 2-The development of its cultivation methods and the provision of fodder - 3-Identifying the types of grazing -	Objectives of the Course
9. Teaching and Learning Strategies	
The most important strategies suitable for the course: 1. Field-Based Learning: Transferring the lecture to the educational field to enable students to distinguish fodder crops (grass and legume) in their different stages of growth, and to practice service, irrigation and fertilization operations themselves. 2. Inquiry-Based Learning: Assign students to calculate the productivity of green fodder and dry matter per square meter, and determine the optimal date for harvesting based on the balance between the quantity of the crop and its nutritional value. 3. Laboratory Analysis: Training students in the laboratory on methods of estimating the nutritional value of feed, such as measuring the percentage of fiber, raw protein, and moisture, to assess the quality of the resulting feed. 4. Applied projects for conservation operations (Project-Based Learning): Assigning students with mini-projects to manufacture silage or Hay in small quantities, and following up the stages of fermentation and corruption to learn the correct preservation methods without loss. 5. Field visits and simulation of reality (Field Trips): Organizing periodic visits to concentrated fodder factories, large cattle or sheep production projects, and natural pasture stations to link plant production	Strategy

with animal consumption.					
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Outputs UNTRANSLATED_CONTENT_START ARTNU UNSLATED_CONTENT_END	Hours	Week
Daily Quizzes Practical Applications	Illustrative lecture with model observation	Split feed yields	☐ Fodder crops	3	1
Daily Quizzes Practical Applications	Illustrative lecture with model observation	Vegetative Description of Pulse Feed	Fodder crops	3	2
Daily Quizzes Practical Applications	Illustrative lecture with model observation	Nutritional description of the endowment benefits	Distinguish between different families	3	3
Display screen +blackboard	Illustrative lecture with model observation	Vegetative Description of Other Factor Feed Stocks	Their families diagnose fodder crops	3	4
Daily Quizzes Practical Applications	Illustrative lecture with model observation	Distinguishing the seeds of the food crops	Distinguish between crop seeds	3	5
Daily Quizzes Practical Applications	Illustrative lecture with model observation	Drinking and Silicone	Distinguish between Dress and Selge	3	6
Daily Quizzes Practical Applications					

		First Month Examination		2	7
Daily Quizzes Practical Applications	Illustrative lecture with model observation	Proceeds of the fodder	Applies crop tampon	3	8
Daily Quizzes Practical Applications	Illustrative lecture with model observation	Blowing and Reasons	Diagnose the causes of emphysema	3	9
Daily Quizzes Practical Applications	Illustrative lecture with model observation	Methods of exploitation of natural plants	Enumerates methods of exploiting natural plants	3	10
Daily Quizzes Practical Applications	Illustrative lecture with model observation	A budget visit to the research station to observe Key Facts	Determines the palatability of animals for fodder	3	11
Daily Quizzes Practical Applications	Illustrative lecture with model observation	Fraudulence	Determine the impact of the bush on fodder crops	3	12
Daily Quizzes Practical Applications	Illustrative lecture with model observation	Conducting reports on the feed crops		3	13
Practical test	Illustrative lecture with model observation	Key Takeaways	Enumerates types of feed mixtures	3	14
		Second Month Examination			15

11. Evaluation of the decision

Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations
Editorial and reporting ... Etc.

12. Sources of Learning and Teaching

Feed and pasture crops, Doctor: Ramadin Ahmed	Required decision books (methodology, if any)
Agriculture and Fodder Exploitation, Doctor:	Main references (sources)

Mahdi Abdellatif	
Scientific journals and reports	Supporting books and references that are recommended in the journals Scientific, Reports (...)
Some researches and articles on the topics of fodder	Online References, Internet Sites

Study of

1. Name of the course
Smart Agriculture
2. Course Code
SAT317
3. Term/ Year
Second semester (2025-2026)
4. The date of preparation of this description
22-2/ 2026
5. Available attendance forms
My full-time attendance (laboratory and field)
6. Number of school hours (total/(number of units)total(
30 hours /units: 1 (for the practical part)
7. Name of the course officer (if more than one name is mentioned)
Prof. Dr. Ahmed Shaker Mohsen Prof. Dr. Ali Hashim Abdul Razzaq Eng. Moataz Abdelkazem
8. Course Objectives

Introducing students to the concepts, principles and components of smart agriculture and its role in developing sustainable agricultural production.

Introduce students to Internet of Things (IoT) applications in crop monitoring and agricultural field management.

Demonstrate the applications of artificial intelligence (AI) and machine learning in crop production, productivity forecasting, and early pest detection.

Develop students' ability to analyze satellite images and drones and use them in crop monitoring.

Provide students with basic skills in analyzing field data using Excel, Python, and R.

Introducing students to the applications of artificial intelligence in providing fertilizer and water recommendations according to crop, soil and weather data.

Introduce students to smart irrigation systems, climate sensors, soil sensors and water resources management based on real-time data.

Provide students with knowledge of the basic principles of programming smart irrigation units using Arduino and Raspberry Pi.

Familiarize students with precision farming applications, including big data, remote sensing, GPS/GIS, and crop nutritional status sensing.

Develop students' ability to evaluate smart farming techniques in terms of resource efficiency, sustainability and applicability in field crops.

9. Teaching and Learning Strategies

Interactive lectures: Present theoretical concepts using pictures, diagrams, examples, case studies and guided questions.

Practical and computerized learning: Applying Excel, Python, and R to agricultural data, conducting organization, analysis, and graphical presentation.

Problem-based learning: Analyzing field problems such as water scarcity, nutrient variability, pest infestation, and productivity prediction.

Project-based learning: Carrying out small projects around sensors, smart irrigation, remote sensing, artificial intelligence, or field data analysis.

Demonstrations and practical applications: display of sensors, GPS/GIS systems, drone imagery, Arduino and Raspberry Pi concepts.

Field and digital learning: Linking field observations with digital agricultural data and the use of scientific sources and databases.

Collaborative learning: group discussions and presentations on smart solutions to crop production problems

10. Course Structure

Assessment Method	Learning Method	Name of the unit or subject	Learning outcomes	Hours	Week
Daily testing	Theoretical lectures and presentations + panel discussions	Smart Agriculture	Defines smart agriculture, explains its importance for sustainable agricultural production and distinguishes its key components.	5	1

Daily testing and field training	Theoretical lectures and presentations + panel discussions	Internet of Things (IoT) in Crop Management	Explains IoT components and applies the concept of connected sensors in crop monitoring.	5	2
Daily testing	Theoretical lectures and presentations + panel discussions	Artificial Intelligence in Crop Production	Explains AI concepts relevant to crop production and identifies its most important agricultural applications.	5	3
Daily test and field visit	Theoretical lectures and presentations + panel discussions	Machine Learning in Productivity Prediction	Explains machine learning concepts and explains its use in productivity forecasting.	5	4
Daily testing and laboratory field visit	Theoretical lectures and presentations + panel discussions	Early detection of pests using AI	Identifies mechanisms for using AI for early detection of lesions and interprets diagnostic results.	5	5
Daily testing Preparing reports on field experiments	Theoretical lectures and presentations + panel discussions	Satellite image analysis	Interprets satellite and drone imagery and identifies its applications in crop monitoring.	5	6
Field visit and study of crop maturity markers	Daily testing	Paper I	Measures understanding of concepts and principles addressed in weeks 1–6.	5	7
Score Rating	Written test	Analyze field data using Excel, Python, and R	Excel uses and understands basic business steps using Python and R to organize and analyze field data.	5	8
Daily testing and field observations	Theoretical lectures and presentations	Artificial intelligence in fertilizer and	Explains the use of AI in composting and water	5	9

	+ panel discussions	water recommendations	recommendations based on field, soil and weather data.		
Daily, Monthly and Final Tests and Laboratory Reports	Theoretical lectures and presentations + panel discussions	Building vegetation and climate databases	Design an initial structure for plant, soil, weather, and field databases and explain their importance in decision making.	5	10
Reports and discussion of them	Theoretical lectures and presentations + panel discussions	Smart Irrigation and Water Management Systems: Sensors	Identifies climate and soil sensors and explains real-time monitoring and water management.	5	11
Daily testing	Theoretical lectures and presentations + panel discussions	Simple Programming for Smart Irrigation Units	Explains the basic principles of smart irrigation programming and the role of Arduino and Raspberry Pi.	5	12
Daily testing, field visit and laboratory reports	Theoretical lectures and presentations + panel discussions	Precision Agriculture: Big Data, Remote Sensing and GPS/GIS	Explains big data and remote sensing applications and uses GPS/GIS concepts in precision agriculture.	5	13
Daily Test Field Training	Theoretical lectures and presentations + panel discussions	Nutritional status sensing and integrated precision farming applications	Explains crop nutritional status sensing techniques and correlates accurate cultivation data with crop management decisions.	5	14
Grade rating	Written Test	Final Review and Second Examination	Integrates key concepts of the material and assesses the application of smart agriculture in field crop	5	15

			production.		
11. Evaluation of the decision					
1. Daily multiple-choice exams (20%) 2. Daily Assessment Exams (10%) 3. Dialogue activities and daily participation 10% 4. Compliance with attendance and controls during the lecture 10% 5. Final Exam 50%					
12. Sources of Learning and Teaching					
Principles of field crop production ,martin , Leonard , and stamp , 3rd edition , Macmillan publishing company , inc 1975. Agronomy Journal.. Crop science Journal.			Principles of field crop production ,martin , Leonard , and stamp , 3rd edition , Macmillan publishing company , inc 1975. Agronomy Journal.. Crop science Journal.		
Legume crops. 1990. Globe Hamid and Talib Ahmed Issa . جامعة بغداد			Required textbooks		
Learning Resources Food and Agriculture Organization of the United Nations (FAO): Resources for Digital and Smart Agriculture. FAOSTAT: Agricultural Data and Statistics. World Bank: Resources for Digital Agriculture and Agricultural Technology. International Society of Precision Agriculture (ISPA): Precision Agriculture Concepts and Resources. Esri: GIS and Spatial Data Resources in Agriculture			Some key resources		
			etc. الكتب والمراجع الساندة التي يوصى بها		
			Electronic references and websites		

Course Description Form

1. Name of the course
Fibre crops
2. Course Code
FICR321
3. Term/ Year
Second semester (2025-2026)
4. The date of preparation of this description
2/2/2025
5. Available attendance forms
Full time (theoretical lecture/practical lecture
6. Number of school hours (total/(number of units)total(
5 hours per week for 14 weeks
7. Name of the course officer (if more than one name is mentioned)
Name : Prof. Dr. Ahmed Shaker Mohsen Email : ahshaker@uowasit.edu.iq Prof. Dr. Ali Hashim Abdul Razzaq
8. Course Objectives
Introducing the student to the different fiber crop groups (seed, bark, and paper), and their strategic role in industry and the national and global economy. • Enabling the student to understand the climatic, terrestrial and water needs of each crop (such as the impact of high temperatures or drought on the quality of cotton and linen fibers). • Learn about modern scientific methods for managing these crops, ranging from soil preparation and plant density, to fertilization, irrigation and pest control. • Studying the technological qualities of fibers (such as length, softness, durability, and maturity) and how to control them genetically and environmentally. • Giving the student the skill of distinguishing between different crops in the field through their vegetative, floral and fruitful qualities, and dissecting the fiber-bearing plant parts. • Practically train the student in the biological, chemical and mechanical methods used in the separation of fibers (such as cotton ginning operations, linen and jute aromatization). • Enabling the student to calculate the optimal plant densities, estimate the productivity of the cadastral unit, and determine the signs of accurate harvest maturity for each crop to reduce waste. • Training the student to use laboratory devices to measure the quality and durability of the staple, and to sort and classify ranks according to standard specifications.
9. Teaching and Learning Strategies

1. Interactive lectures: Presenting theoretical material using visual media, asking questions and brainstorming to link physiology to production. 2. Field and laboratory learning: direct training in the field (excellence of branches, calculation of density, and signs of maturity) and laboratory (aromatization experiments and staple quality inspection). 3. Problem-based learning: Analyzing realistic field problems (such as cotton nut loss or environmental stresses such as those associated with heat and salinity) and developing scientific solutions to them. 4. Project-based learning: commissioning students with mini-researches on the sustainable uses of by-products (e.g., oils, wood-paper-making). 5. Field visits and digital research: Reviewing the mechanisms of work in gins and textile factories, and using the digital library to write reports.	Strategy
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10. Course Structure

Assessment Method	Learning Method	Name of the unit or subject	Learning outcomes	Hours	Week
Pre-assessment (rapid) questions and class discussion	Interactive lecture Brainstorming and displaying photo samples	General Introduction to Fibre Crops	Defines fiber crops and explains their economic importance. Crops are strictly classified according to the origin of the fiber (seed, bark, leaf).	2	1
Quiz Verbal Engagement	Theoretical lecture Presentation of stereoscopic models or field samples	Cotton Crop: (Importance and Botanical Description)	Explains the economic importance and origin of cotton. Describes the root and vegetative parts of cotton with scientific precision.	2	2
Evaluation of the floral parts drawing worksheet	Lecture powered by illustrations Animated video presentation of developmental stages	Cotton: (flowers, pollination, nut formation)	Identifies the floral parts and the nature of pollination in cotton. Tracks the growth and formation stages of the nut (seed).	2	3
Homework (solving a problem or guiding)	Interactive Lecture Case Study (Environment)	Cotton: (Environmental Needs and Service Operations)	Identifies climatic and soil needs ideal for cotton growth. Establishes a correct program for irrigation and fertilization	2	4

problem)	al Stress Impact)		operations.		
Assess students' participation in the discussion	Video presentation of agricultural mechanization Group discussion (advantages and disadvantages of roads)	Cotton: (ripening, harvesting and sorting)	Identifies signs of full maturity of cotton. Compares manual and mechanical ginie and initial screening determinants.	2	5
Evaluation of a simplified scientific report on cotton grades	Technological lecture Presenting real samples of cotton ranks	Cotton Fibre and Gin Technology	Analyzes fiber quality qualities (length, durability, softness, maturity). Explains how the gins work and separates the seeds from the hair.	2	6
First Written Test Score	test session.	Test 1	Measuring the student's understanding of the concepts and scientific foundations of the cotton crop from week 1 to 6.	2	7
UNTRANSLATED_CONTENT_START أسئلة شفوية UNTRANSLATED_CONTENT_END	Comparative Theoretical Lecture (Cotton vs Linen)	Flax Crop: (Importance, Description and Environment)	Demonstrates the dual importance of linen (fiber and oil). Describes the vegetative appearance of flax and identifies its environmental needs.	2	8
Homework (Comparison of planting systems)	Lecture powered by digital and field data	Flax: (Agricultural operations and harvesting)	Determines planting methods, seeding rates and fertilization of flax. Explains the timing and correct method of harvesting the crop.	2	9
Evaluation of a flow chart drawn by the student	Demonstration (Process Flowchart) Interactive Discussion	Linen Fibre Extraction	Explains the mechanics of the maceration process (biochemical). Describes crushing and combing operations to obtain clean fibers.	2	10
Quiz 2	Lecture Theory Presentation of Samples of Industrial Jute Products	Jute Crop	Summarizes the economic and environmental importance of the jute crop. Identifies the steps for serving and extracting jute fibers.	2	11
UNTRANSLATED_CONTENT_START تقييم العرض المشاركة/التقديم	Student Engaged PPT Brainstorming	Leafy and Hard Fibre Crops	Identifies solid fiber crops (sisal, loofah, or pearl). Connects the nature of solid fibers to their industrial uses.	2	12

UNTRANSLATED_CONTENT_END					
Evaluation of a proposal for an integrated control plan for a particular pest	Lecture supported by diagnostic images Field injury case study	Pests, diseases and methods of control	Diagnose the most important insects (cotton leafworm, almond worms) and diseases (wilt). Suggests integrated control methods (biological, chemical, agricultural).	2	13
Panel Performance Evaluation	Seminar Group Brainstorming	General review and assessment of recent prospects	Connects fibre crop production with modern industrial trends. Develops a critical view of the constraints and development of cultivation of these crops.	2	14
Second / Final Written Test Score	test session.	Second test (final written)	Measure the learning outcomes of the entire course (focusing on the second part of the curriculum and overall linkage).	2	15

11. Evaluation of the decision

- Editorial Exams: Monthly and Final
- Daily, monthly tests.
- Research Reports
- Activism and engagement

12. Sources of Learning and Teaching

• Kozłowski, R. M., & Mackiewicz-Talarczyk, M. (Eds.). (2022). Handbook of Natural Fibres: Volume 1: Production: Processing and Link to Industry (2nd ed.). Elsevier.	Global Reference Books
• Fibre Crop Production and Fibre Technology: <i>Authors:</i> Adeeb Al-Khatib et al. (or the curricula adopted in the Arab colleges of agriculture such as the universities of Baghdad, Mosul, or Alexandria). <i>Focus:</i> This book covers the morphological and productive fundamentals of cotton and linen, field processes, and an introduction to ginning and extraction technology. • Field Crop Production (Fibre Crop Portion) <i>Authors:</i> A selection of crop professors in local/Arab universities.	Arabic references :

<i>Focus:</i> Focuses on technical packages for agriculture, environmental needs, fertilization, and irrigation for high productivity.	
Specialized international organizations and institutions (International Organizations) International Cotton Advisory Committee (ICAC) Data Portal - Link: https://www.icac.org - Importance: International Cotton Advisory Committee Digital Portal. Provides interactive databases on global production, consumption, prices, and technological developments in cotton fiber ginning and production, excellent for week 1 and 6. FAOSTAT - Food and Agriculture Organization (Commodities Database) - Link: https://www.fao.org/faostat - Importance: Food and Agriculture Organization (FAO) database. It allows the researcher and the teacher to extract accurate digital statistics and timetables for the production and cultivation areas of fiber crops (cotton, flax, jute) locally, regionally and globally. International Jute Study Group (IJSJ) Digital Archives - Link: https://www.jute.org - Importance: A digital platform specializing in cortical crops, especially jute and teal. Provides studies on methods of	Digital Resources and Databases
	Educational Videos

1. Name of the course
Fibre Crops/Practical
2. Course Code
FICR321
3. Term/ Year
2025-2026
4. The date of preparation of this description

02/02/2026					
5. Available attendance forms					
In-Person					
6. Number of school hours (total/(number of units)total(					
3 hours per week for 15 weeks/ 1					
7. Name of the course officer (if more than one name is mentioned)					
Prof. Dr. Ahmed Shaker Mohsen Prof. Dr. Ali Hashim Abdul Razzaq Eng. Zahra Hamid RuwaidiEmail : zRuwaidi@uowasit.edu.iq					
8. Course Objectives					
This course aims to Enabling the student with the applied skills to grow fiber crops (cotton, flax, jute,jingle, sisal, ramie), and to identify the plant description, service processes and fiber extraction.				Objectives	
9. Teaching and Learning Strategies					
Field learning, demos, scientific visits, and teamwork in the lab Evaluation method: Monthly exams (theoretical/practical), field reports, weekly activity evaluation, and a comprehensive final exam				الاستراتيجية	
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning outcomes	Hours	Wee k
Discuss and identify samples	View Laboratory Samples	Fiber Models by Sources and Origin	Identify the types of fibers and their origins	3	1
Germination Results Report	Practical experience (laboratory)	Fibre crop seeds and laboratory germination	Seed recognition and germination	3	2
An oral exam	Laboratory familiariza tion tour	Laboratory devices used in the field of fibers	Familiarity with the techniques and devices used	3	3

Solving problems and measuring samples	Athletic and practical application	Calculation of length, smoothness, maturity, staple durability and humidity	Acquiring the skill of qualitative measurement of fibers	3	4
Skill Assessment	Lecture and Preliminary Application	Botanical Description and Soil Service Operations	Understand agricultural requirements and soil service	3	5
Performance Evaluation	Making an Applied Field	Preparing the land and planting cotton in the field	Actual Field Application Procedure	3	6
Exam Grade	Written Test	First trimester.	Comprehension Assessment for Phase 1	3	7
Drawing and marking plant parts	Plant Specimen	Botanical description of the flax crop	Morphological characterization of flax	3	8
Daily Quizzes Discussion	Hands-on Lecture Microsoft PowerPoint	Flax crop service and fiber extraction methods	Learn fiber extraction and service methods	3	9
Daily Quizzes Discussion	Hands-on Lecture Microsoft PowerPoint	Botanical description of jute (red, green, prismatic)	Distinguishing between jute varieties	3	10
Daily Quizzes Discussion	Hands-on Lecture Microsoft PowerPoint	Soil and Jute Crop Service Operations	Crop management (irrigation, fertilization, control)	3	11
TECHNICAL REPORT	Hands-on Lecture Microsoft PowerPoint	Vegetative Description of Jute and Service Operations	Recognize the plant properties of jute	3	12

Daily Quizzes Discussion	Hands-on Lecture Microsoft PowerPoint	Shooter Botanical Description and Service Operations	Identify the plant characteristics of the shooter	3	13
Exam Grade	Written Test	UNTRANSLATED_CONTENT_START امتحان الشهر الثاني UNTRANSLATED_CONTENT_END	Comprehension Assessment	3	14
Visit report	- Field trip.	Field visit and general review of the material	Link between academic study and reality	3	15

11. Evaluation of the decision

Daily , monthly, final exams
Discussion Questions Sharing Scores
Field and Laboratory Trials

12. Sources of Learning and Teaching

Fiber Crops Book by Dr.Hikmat Abdul Ali and Dr. Majeed Mohsen Al-Ansari	Required textbooks
Field Crops Book (Fibre Crops Part)by Dr.Maki Alwan Al-Mukhtar and Dr.Abdul Hamid Ahmed Younis	الكتب والمراجع الساندة التي يوصى بها
https://youtu.be/fOK3HgKjzAg?si=XHgwzj3MMDgJl2UU chrome-extension https://efaidnbmnnnibpcajpcglclefindmkaj/https://uomosul.edu.iq/agriculture/wp-content/uploads/sites/11/2023/09/%D9%85%D8%AD%D8%A7%D8%B6%D8%B1%D8%A7%D8%AA_%D9%85%D8%AD%D8%A7%D8%B5%D9%8A%D9%84-%D8%A7%D9%84%D9%8A%D8%A7%D9%81-%D8%B9%85%D9%84%D9%8A.pdf	Electronic references, websites ,.....

Course Description Form

1. Course Name :	
Crops Machine	
2. Course Code	
FICM322	
3. Term/ Year :	
Third Stage /Second Semester 2025-2026	
4. Date of preparation of this description:	
2025-26	
5. Available attendance forms	
Full-time in-person education	
6. Number of school hours (total/(number of units) total) :	
30 hours (2 hours per week)	
7. Name of the course officer (if more than one name is mentioned) :	
Um...Dr. Ahmed Kate Abd Eng. Abbas Rakhis	
8. Course Objectives	
Its main objectives can be summarized in five basic points: 1. Identifying and classifying agricultural machines: Understanding the parts, mechanism of work, and functions of the machines used in all stages of production (soil preparation, leveling, seeding, fertilization, spraying, and harvesting machines). 2. Calibration and correct operation (Calibration): Acquiring the practical skill of calibrating machines (such as calibrating seeding machines to ensure the required plant density, or calibrating sprinklers to ensure the regular distribution of pesticides without waste). 3. Management and maintenance of agricultural machinery: Identify the foundations of periodic maintenance of tractors and equipment, and how to store and protect them, to ensure the continuity of their work and raise their operational efficiency. 4. Economic and engineering evaluation of the machine: The ability to calculate the costs of operating the machines, choose the appropriate equipment for the area and type of crop, and compare the feasibility of buying or renting the machine. 5. Application of technologies and smart agriculture: Keeping abreast of technological development by understanding the role of modern	Objectives of the Course

mechanization (Precision Agriculture, sensors, and automatic GPS guidance systems) in improving the productivity of field crops.					
9. Teaching and Learning Strategies					
1- Student participation in the seminars 2- Developing the student's capabilities to reach the stage of analysis Conclusion-3 is a competitive atmosphere between students in their answers to scientific topics when asked					Strategy
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Quarterly exams Reports +	Lecture and presentation Slides	Identifying the induction machines Al-Tarbah for Initial Transactions (Tillage Machines)	PLANTING SOIL PREPARATION	2	ABBREVIATIONS . 3
Quarterly exams Reports +	Lecture and presentation Slides	Theatrical hearth plow Types and regulations	Explains the use of the excavated plough	2	Second
Quarterly exams Reports +	Lecture and presentation Slides	Disc ploughing is a species And regulations	Enumerates disc plows	2	Third
Quarterly exams Reports +	Lecture and presentation Slides	Excavation ploughing and regulation of rotary ploughing are qualitative Operation and regulation	Regulates the tillage process	2	Fourth
		First Month Examination			Fifth

Quarterly exams Reports +	Lecture and presentation Slides	Identification of induction machines Al-Tarbah for Secondary Transactions (Al-Tarbah Softening Machines)	Defines smoothing and leveling machines	2	Sixth
Quarterly exams Reports +	Lecture and presentation Slides	Disc combs of all kinds and its regulations	Distinguish between types of combs	2	Seventh
Quarterly exams Reports +	Lecture and presentation Slides	Reciprocating Mechanical Problem	Knows comb for my frequency	2	Eighth
Quarterly exams Reports +	Lecture and presentation Slides	Soil indexes	Knows soil mills	2	-
Quarterly exams Reports +	Lecture and presentation Slides	Equipment Identification Special	Special. equipment	2	10th
Quarterly exams Reports +	Lecture and presentation Slides	Plowing under the soil surface	Enumerates own machines	2	Eleventh
Quarterly exams Reports +	Lecture and presentation Slides	Driver's Opener	Defines the plow under the soil	2	Twelfth
Quarterly exams Reports +	Lecture and presentation Slides	Fateh Al-Marouz and Al-Batan	Distinguish between types of waterway openers	2	13th
Quarterly exams Reports +	Lecture and presentation Slides	Composite machines of various types and the purpose of their use	Practically applies the light of the broth	2	Fourteen th
		Second Month Examination	Determines the types of installed machines		Fifteenth

11. Evaluation of the decision	
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations Editorial and reporting ... Etc. Homework : 15% Daily Examination: 15% Editorial Examination: 50% Scientific Reports: 20%	
12. Sources of Learning and Teaching	
Soil Preparation Equipment Book- Aziz Ram Al-Banna	Required decision books (methodology, if any)
Book of Agricultural Components and Machinery – Yassin Hashem Al-Tahin	Main references (sources)
There is no	Supporting books and references that are recommended for scientific fields, Reports (...)
https://www.motorscaffa.com/2019/11/types-of-agricultural-plows-pdf.html	Online References, Internet Sites

1. Course Name :
Crop Machins Practical
2. Course Code
FICM322
3. Term/ Year : 2025-2026
Second Semester Third Stage
4. Date of preparation of this description:
2025–26
5. Available attendance forms
Full-time in-person education
6. Number of school hours (total/(number of units)total(
45 hours (3 hours per week)
7. Name of the course officer (if more than one name is mentioned) :
Eng. Abbas Rakhis

8. Course Objectives					
Its main objectives can be summarized in five basic points: • 1. Identifying and classifying agricultural machines: Understanding the parts, mechanism of work, and functions of the machines used in all stages of production (soil preparation, leveling, seeding, fertilization, spraying, and harvesting machines). • 2. Calibration and correct operation (Calibration): Acquiring the practical skill of calibrating machines (such as calibrating seeding machines to ensure the required plant density, or calibrating sprinklers to ensure the regular distribution of pesticides without waste). • 3. Management and maintenance of agricultural machinery: Identify the foundations of periodic maintenance of tractors and equipment, and how to store and protect them, to ensure the continuity of their work and raise their operational efficiency. • 4. Economic and engineering evaluation of the machine: The ability to calculate the costs of operating the machines, choose the appropriate equipment for the area and type of crop, and compare the feasibility of buying or renting the machine. • 5. Application of technologies and smart agriculture: Keeping pace with technological development by understanding the role of modern mechanization (Precision Agriculture, sensors, and automatic GPS guidance systems) in improving the productivity of field crops					Objectives of the study
9. Teaching and Learning Strategies					
1- Student participation in the seminars 2- Developing the student's capabilities to reach the stage of analysis Conclusion-3 is a competitive atmosphere between students in their answers to scientific topics when asked					Strategy
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Quarterly exams Reports +	Lecture and presentation Slides	Identifying the induction machines Al-Tarbah for Initial Transactions (Tillage Machines)	Knows Seed Preparation Machines	3	ABBREVIATIONS . 3
Quarterly exams Reports +	Lecture and presentation Slides	Theatrical hearth plow Types and regulations	Distinguish between types of plows	3	Second

Quarterly exams Reports +	Lecture and presentation Slides	Disc ploughing is a species And regulations	Enumerates the types of disc plows +	3	Third
Quarterly exams Reports +	Lecture and presentation Slides	Excavation ploughing and regulation of rotary ploughing are qualitative Operation and regulation	Identifies methods of organizing the plough	3	Fourth
		First Month Examination			Fifth
Quarterly exams Reports +	Lecture and presentation Slides	Identification of induction machines for Al-Tarbah Secondary Transactions (Al-Tarbah Softening Machines)	PLANTING SOIL PREPARATION	3	Sixth
Quarterly exams Reports +	Lecture and presentation Slides	Disc combs of all kinds and its regulations	Disk combs are used for plowing	3	Seventh
Quarterly exams Reports +	Lecture and presentation Slides	Reciprocating Mechanical Problem	Diagnoses the reciprocating metatarsal	3	Eighth
Quarterly exams Reports +	Lecture and presentation Slides	Soil indexes	Knows soil mills	3	-
Quarterly exams Reports +	Lecture and presentation Slides	Equipment Identification Special	Enumerates own machines	3	10th
Quarterly exams Reports +	Lecture and presentation Slides	Plowing under the soil surface	Defines the plow under the soil	3	Eleventh

Quarterly exams Reports +	Lecture and presentation Slides	Driver's Opener	Distinguish between types of waterway openers	3	Twelfth
Quarterly exams Reports +	Lecture and presentation Slides	Fateh Al-Marouz and Al-Batan	Practically applies the light of the broth	3	13th
Quarterly exams Reports +	Lecture and presentation Slides	Composite machines of various types and the purpose of their use	Determines the types of installed machines	3	Fourteenth
		Second Month Examination		3	Fifteenth

11. Evaluation of the decision

Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations
 Editorial and reporting ... Etc.
Homework : 15% Daily Examination: 15% Editorial Examination: 50% Scientific Reports: 20%

12. Sources of Learning and Teaching

Soil Preparation Equipment Book- Aziz Ram Al-Banna	Required decision books (methodology, if any)
Book of Agricultural Components and Machinery – Yassin Hashem Al-Tahin	Main references (sources)
There is no	Supporting books and references that are recommended for scientific fields, Reports (...)
https://www.motorscaffa.com/2019/11/types-of-agricultural-plows-pdf.html	Online References, Internet Sites

Study of

1. Name of the course
Lgume Crops
2. Course Code

LECR323					
3. Term/ Year					
Second semester (2025-2026)					
4. The date of preparation of this description					
22-2/ 2026					
5. Available attendance forms					
My full-time attendance (laboratory and field)					
6. Number of school hours (total/(number of units)total(					
30 Hours /Units: 2 (for theoretical part)					
7. Name of the course officer (if more than one name is mentioned)					
Dr. Hussein Ibrahim Taresh htarish@uowasit.edu Eng. Wamidh Ali Hussain wali@uowasit.edu.iq Eng. Balqis Mohsen Sultan					
8. Course Objectives					
Studying the most important legume crops (beans, chickpeas, lentils, cattle, beans, cowpeas, soybeans, field pistachios and peas) and identifying their economic and nutritional importance, their plant classification, discrimination, stages of development , appropriate soil conditions for their growth and production, the most important varieties cultivated in Iraq and their respective soil and crop service processes, including calculations of plant density, quantities of seeds, fertilizers, pesticides and bacterial pollination, methods of harvesting them, and conditions for storing and classifying their seeds. It includes a glimpse of methods of breeding and improving them, including the use of modern technologies such as tissue cultivation and genetic engineering.					
9. Teaching and Learning Strategies					
Practical and field education: Organizing visits to legume farms and research stations, and training students in fields and greenhouses to cultivate and serve the crop. Presentations and Interactive Presentations: Using Simulations and Visual Illustrations of Plant Growth Stages Field experiments: Perform germination tests and calculate seed characteristics, bacterial nodes (rhizobium), and protein ratios.					
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning outcomes	Hours	Week

Daily testing	Theoretical lectures and presentations + panel discussions	Seed legume crops, the importance of legumes in nutrition.	It shows the economic and nutritional importance of seed leguminous crops and their role in nutrition.	2	1
Daily testing and field training	Theoretical lectures and presentations + panel discussions	Symbiotic nitrogen fixation, node formation, cross-pollination aggregates, nitrogen fixation gene engineering.	Distinguish between mix bacterial insemination aggregates and root ganglia formation mechanism for symbiotic nitrogen fixation.	2	2
Daily testing	Theoretical lectures and presentations + panel discussions	Overlapping agriculture	Explains the concept and importance of intercropping between legumes and other crops.	2	3
Daily test and field visit	Theoretical lectures and presentations + panel discussions	Beans, origin , geographical distribution, economic importance, and uses of beans.	Explains the geographical and environmental distribution of the bean crop and its relationship to the center of origin.	2	4
Daily testing and laboratory field visit	Theoretical lectures and presentations + panel discussions	Nutritional value of beans, chemical composition of seeds ,varieties , genetic sources.	Shows the nutritional value and chemical composition of pea seeds , chickpeas and lentils.	2	5
Daily testing Preparing reports on field experiments	Theoretical lectures and presentations + panel discussions	Beans breeding programs, maturation ,harvesting ,ingredients of the crop.	It clarifies the objectives and strategies of bean breeding programs and the genetic resources available to them.	2	6

Field visit and study of crop maturity markers	Daily testing	Chickpeas , economic importance and use , chemical composition of chickpea seeds.	It explains the signs and stages of physiological maturation and the components of the quotient for the chickpea crop.	2	7
Score Rating	Written test	First Monthly Examination	Evaluating the level of students for lectures and the extent of their understanding of the scientific subject	2	8
Daily testing and field observations	Theoretical lectures and presentations + panel discussions	Lentils , economic importance, nutritional value,maturity , harvest.	Shows environmental requirements, ripening and harvesting periods for the lentil crop	2	9
Daily, Monthly and Final Tests and Laboratory Reports	Theoretical lectures and presentations + panel discussions	Cattle, economic importance, nutritional value, maturity , harvest.	Shows the environmental requirements and the maturation and harvesting periods of the cattle crop	2	10
Reports and discussion of them	Theoretical lectures and presentations + panel discussions	beans , economic importance, nutritional value,maturity , harvest.	It shows the production characteristics and nutritional value of the pea crop and the methods of harvesting it.	2	11
Daily testing	Theoretical lectures and presentations + panel discussions	Cowpeas , economic importance, nutritional value, maturity , harvest.	It shows the production characteristics and nutritional value of the crop and the methods of harvesting it.	2	12
Daily testing, field visit and	Theoretical lectures and	Soybeans , economic	It shows the production characteristics	2	13

laboratory reports	presentations + panel discussions	importance, nutritional value, ripening , harvesting.	and nutritional value of the soybean crop and the methods of harvesting it.		
Daily Test Field Training	Theoretical lectures and presentations + panel discussions	Field pistachios, economic importance, nutritional value, maturity , harvest.	It shows the production characteristics and nutritional value of the field's pistachio crop and peas and the methods of harvesting them.	2	14
Grade rating	Written Test	Second Monthly Exam	Evaluating the level of students for lectures and the extent of their understanding of the scientific subject	2	15

11. Evaluation of the decision

6. Daily multiple-choice exams (20%)
7. Daily Assessment Exams (10%)
8. Dialogue activities and daily participation 10%
9. Compliance with attendance and controls during the lecture 10%
10. Final Exam 50%

12. Sources of Learning and Teaching

Principles of field crop production ,martin , Leonard , and stamp , 3rd edition , Macmillan publishing company , inc 1975. Agronomy Journal.. Crop science Journal.	Principles of field crop production ,martin , Leonard , and stamp , 3rd edition , Macmillan publishing company , inc 1975. Agronomy Journal.. Crop science Journal.
Legume crops. 1990. Globe Hamid and Talib Ahmed Issa . جامعة بغداد	Required textbooks
	Some key resources
Crop Sciences and Metabolism Journal	etc. الكتب والمراجع السائدة التي يوصى بها
https://legumehub.eu/ ; https://cropprotectionnetwork.org/	Electronic references and websites

1. Course Name:	
Lagume crop /Practical	
2. Course Code	
LECR323	
3. Term:Second / Year :	
Chapter 2/ Stage 3	
4. Date of preparation of this description:	
2024-2	
5. Available attendance forms:	
Full time attendance	
6. Number of school hours (total)	
1:5 / Number of units (total) 3 hours per week	
7. Name of the course officer (if more than one name is mentioned)	
Prof. Dr. Hussein Ibrahim Tarish Eng. Wamid Majeed Ali Eng. Balqis Mohsen Sultan	
Providing the student with practical and theoretical information on the field management. 8	
Objectives of the course -	
• Ability to work in the agricultural sector and in the field of field crops • Increasing the spirit of competition between students for the sake of scientific excellence to obtain good job opportunities • Increasing competition among students in order to obtain the opportunity to apply to graduate studies • Preparing two scientific researchers in the field of field crops • Providing advice and information to the relevant institutions and ministries	
9. Teaching and Learning Strategies	
1- Working on the extraction of the application with concepts in the field of field management in a good way -2 Working on the extraction of a knowledgeable applicant with knowledge related to the management of the fields, such as the segregation of plants and water and puncture 3- The definition of the application in terms of the types and nature of its growth, the methods of its dissemination and multiplication, and the mark of its growth and harvest. 4- Definition of the application in the equipment used in the management of laboratory and field crops. 5- Defining the student in the nature of dealing with seeds used in agriculture	Strategy

in the field of crop management.					
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Tests Daily and Monthly	Point Power Lecturer	Importance of legumes	Definition of the importance of pulse crops	3	1
Evaluate a project	Local scenes Laboratory	Remaining – Botanical description- Classification- Diseases	Knowledge of vegetarian description of legumes	3	2
Discussion of reports	Field application	Lentils – Plant prescription – Classification – Diseases	Knowledge of botanical description of lentils	3	3
Tests Daily and Monthly	Lecture with an explanation of a presentation Introductory	Acidosis – Vegetarianism – Classification- Diseases	Knowledge of the vegetarian description of chickpeas	3	4
Evaluate a project	Lecture with an explanation of a presentation Introductory	Examination -1-		3	5
Discussion of reports	Local scenes Laboratory	Livestock- Plant Description- Classification- Diseases	Knowledge of vegan description of livestock	3	6
Tests Daily and Monthly	Field application	Field Completion- Description Vegetarian Classification – Illnesses	Knowledge of pistachio varieties and diagnosis of diseases	3	7
Evaluate a project	Lecture with an explanation of a presentation Introductory	Hartmann – Description	Description of Hartmann	3	8
Discussion of reports	Lecture with an explanation of a	Examination -2-		3	9

	presentation Introductory				
Tests Daily and Monthly	Local scenes Laboratory	Soya beans – plant prescription- diseases- classifications	Description of soybeans and diagnosis of diseases	3	10
Evaluate a project	Field application	Beans- Vegetarian Prescription – Classification - Diseases	Description of beans and knowledge of their varieties	3	11
Discussion of reports	Lecture with an explanation of a presentation Introductory	Basalia- Vegetarianism- Classification – Diseases	Description of the basalia and knowledge of its varieties and diseases	3	12
Discussion of reports	Lecture with an explanation of a presentation Introductory			3	
Tests Daily and Monthly	Local scenes Laboratory	Lubya- Vegetarian Description-	Description of Vegetarian Cowpeas	3	13
Evaluate a project	Field application	Overlapping agriculture		3	14
Discussion of reports	Lecture with an explanation of a presentation Introductory	Harvester and crop storage Pulses	Knowing the methods of harvesting legumes	3	15
Distribution of the grade of 30 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations Editorial and reporting ... Etc.					
12. Sources of Learning and Teaching					
			Required decision books (methodology, if any)		
1. Scientific foundations for the management, production and improvement of crops Field . Hussain Al Maeeni and Mohammed Owaid Ghair Al Abedi . Faculty of Agriculture – University . Al-Anbar, 2018-2 Principles of the production of field crops, Mohammed Haddal, Kadhim Al-Baldawi, Alaa Al-Din Abdul Majid Al-Jabri and Muwaffaq Abdul Razak Saheel Al-Naqiq . Faculty of			Main references (sources)		

Agriculture – University After 2014-3 Cereals and Pulses (Practical Part) , Dr.Kamel Mohammed Al-Khafaji , University of Baghdad 2111	
	Supporting books and references that are recommended for scientific fields, Reports (...)
	Online References, Internet Sites

نموذج وصف المقرر

1. المقرر اسم:	Field Crop Disease
2. Course Code	FICD324
3. السنة/ الفصل :	Autumn semester of the academic year 2025/2026
4. Date this description was prepared	10 – 3
5. Available attendance forms	
6. Available Attendance Forms:	
	Total number of hours 45 hours and total number of units 3.5
7. Number of Credit Hours (Total)/Number of Units (Total)	Name: Prof. Dr. Jawadin Talib Abdul Email : jalkooranee@uowasit.edu.iq
8. Course Objectives	- Introducing students to the basic concepts of plant pathology and its importance in protecting field crops. - Providing students with knowledge of the history of the development of plant pathology and its role in improving agricultural production. - Clarify the importance of plant diseases and the direct and indirect economic losses they cause. - Introducing students to the stages of development of plant disease and the factors affecting its occurrence and spread. - Understand the mechanisms of different pathogens in pathogenesis of plants - Identify the natural and induced means of defense possessed by plants against pathogens. - Studying the most important diseases that affect the main field crops in Iraq and the world. - Enabling students to diagnose plant diseases based on symptoms and pathological signs. - Understand the role of environmental conditions in the development and spread of plant diseases. - Identify the life cycles of different pathogens and their relationship to the occurrence of the disease. - Developing the ability of students to choose and implement appropriate control programs for plant diseases.
9. TEACHING AND LEARNING STRATEGIES	

Theoretical lectures : Presenting basic scientific concepts using demonstrations and modern teaching aids.

Scientific discussion :Encouraging students to dialogue, discussion and analysis of problems related to plant diseases.

Problem-Based Learning :Presenting real pathological cases and encouraging students to diagnose them and suggest appropriate solutions.

Collaborative learning : carrying out group activities to diagnose diseases and discuss means of combating them.

Presentations: Students are assigned to prepare and present scientific topics related to field crop diseases.

Practical and laboratory applications ::Studying disease samples and diagnosing pathogens using available laboratory means.

E-learning: Taking advantage of digital sources, scientific sites and databases specialized in plant diseases.

Field visits : Visiting agricultural fields to see symptoms and diagnose injuries under normal conditions.

10. Course Structure

WE EK	Hours	Intended Learning Outcomes	Module / Course Name or	method of learning	Valuation method
I	2	Identify the emergence and development of plant pathology and its importance in protecting agricultural crops.	plant pathology	Lecture and discussion	Classroom Participation
2	2	Clarify the importance of plant diseases and their impact on agricultural production.	Importance of plant diseases and direct and indirect losses	Lecture and Example Presentation	Quiz
3	2	Understanding the stages of development of plant disease and the factors affecting it.	Phases of Plant Disease Development and Disease Cycle	Lecture and discussion	Homework.
4	2	Explanation of the mechanisms of the pathogen in causing the pathological injury.	Mechanisms of the pathogen in causing the disease	Lecture and Demonstration	Quiz
5	2	Recognize natural and plant-induced defenses.	Plant defenses against pathogens	Lecture and discussion	school work, ought, duty, onus, must, task, trust, imperative, obligation, office
6	2	Diagnosing the most important diseases of wheat	Wheat and barley diseases	Lecture and presentation	Practical Evaluation

		and barley and identifying their causes, life cycles and ways to combat them.		ion of samples and pictures	
7	2	Assess students' understanding of basic concepts and wheat and barley diseases.	First trimester.	Written Test	exam
8	2	Identify the symptoms and causes of sorghum diseases, their life cycles and ways to combat them.	Sorghum	Lecture and Demonstration	Quiz
9	2	Diagnosing the most important yellow corn diseases and identifying their management methods.	Popcorn.	Lecture and discussion	Homework.
10	2	Understanding sesame diseases, their pathogens and the conditions suitable for their spread.	Sesame Diseases	Lecture and presentation of pictures and samples	Practical Evaluation
11	2	Identify the most important diseases that affect the sunflower and its life cycles and ways to combat them.	Sunflower	Lecture and discussion	UNTRANSLATED_CONTENT_START تقرير علمي UNTRANSLATED_CONTENT_END
12	2	Identify the most important diseases of field leguminous crops.	Field Legume Diseases	Lecture and Demonstration	Quiz
13	2	Understand the role of environmental conditions in the occurrence and spread of plant diseases.	Environmental factors and epidemiology	Lecture and discussion	school work, ought, duty, onus, must, task, trust, imperative, obligation, office
14	2	Application of integrated management programs to combat field crop diseases.	Integrated Field Crop Disease Management	Lecture and Case Study	Presentation
15	2	Assess the knowledge gained during the semester.	UNTRANSLATED_CONTENT_START امتحان الشهر	Written Test	exam

			UNTRAN SLATED_CON TENT_END		
11. Course Evaluation					
Distribution of the score of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly and written examinations and reports etc.					
12. Learning and Teaching Resources					
Required textbooks (methodology if any)					
Key References (Sources)			Diseases of Field Crops. CBS Publishers & Distributors.		
بها يوصى التي الساندة والمراجع الكتب (التقارير العلمية، المجلات)....			Plant Pathology Department 6th edition. Academic Press/Elsevier Science.		
E-References , Websites			Introduction to Plant Pathology. Wiley-Blackwell.		
			-American Phytopathological Society (APS) -CABI Crop Protection Compendium -FAO Plant Health Portal -Plant Disease Journal		

Study of

1. Name of the course
Field Crop Diseases/Practical
2. Course Code
FICD324
3. Term/ Year
2025-2026
4. The date of preparation of this description
02/02/2026
5. Available attendance forms
Full time (lecture practical)
6. Number of school hours (total/(number of units)total(
3 hours per week for 15 weeks/ 1 (45 hours)
7. Name of the course officer (if more than one name is mentioned)
Prof. Dr. Jawadin Talib Abdul Msc. Wars Faisal Khuraibet
Email : wers.f.alegaieli@uowasit.edu.iq

8. Course Objectives					
This course aims to 1- Introducing students to basic concepts in field crop pathology. 2- Enabling students to identify the most important diseases that affect field crops. 3- Studying the various pathogens. 4- Developing field and laboratory diagnostic skills for plant diseases.				Objectives	
9. Teaching and Learning Strategies					
1- The lecture is interactive to present the basic concepts while engaging students through questions and discussion. 2- Training students to examine infected plant samples, use a microscope, and diagnose pathogens. 3- Field visits to agricultural fields to observe the symptoms and link them to practical reality. 4- Using educational aids such as photos and educational videos.				Strategy	
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning outcomes	Hours	Week
Short quizzes Quis Asking questions	Microsoft PowerPoint Laboratory Diagnosis	General Introduction to Plant Pathology	Explains the basic concepts of plant pathology	3	1
Short quizzes Quis Evaluate the outcome of	Lecture PowerPoint Isolation and Diagnosis	Wheat Diseases	Distinguishes the most important diseases that affect the wheat crop in terms of symptoms and pathogens	3	2
Short quizzes Quis test (oral-)	Field Tour and Sample Collection	Malt Diseases	Diagnose diseases that affect the barley crop. Distinguish between symptoms and lack of members	3	3
Short quizzes Quis Live Review	Lecture Microsoft PowerPoint	Rice diseases	Enumerates diseases that affect rice The most important diseases diagnose the symptoms and	3	4

	Laboratory Isolation		pathogens of rice		
-	-	Month 1	-	-	5
Short quizzes Quis Assessment of speaking skill	Lecture Microsoft PowerPoint Diagnosis models	Popcorn.	It distinguishes and diagnoses the most important diseases that affect the maize crop. Course of treatment?	3	6
Discussion storage	Lecture Microsoft PowerPoint Watch Videos	Sorghum	Distinguish between diseases that affect the crop of sorghum and maize in terms of symptoms and pathogens	3	7
Short quizzes Quis Assessment of speaking skill	Lecture Microsoft PowerPoint Panel discussion	Sunflower	Distinguishes and diagnoses the most important diseases that affect the sun flower crop in terms of symptoms and pathogens	3	8
Discussion of a report	Collecting field models	Safflower diseases	Distinguishes and diagnoses the most important diseases that affect the safflower crop in terms of symptoms and pathogens	3	9
Short quizzes Quis	Hands-on Lecture Microsoft PowerPoint Tyre	Sesame Diseases	Diagnose the most important diseases that affect the sesame crop and distinguish the symptoms and pathogens	3	10
Short quizzes Quis	Lecture Video	Diabetic Beet Disease	Diagnose the most important diseases that	3	11

Evaluate a skill			affect the crop of sugar beets and distinguish the symptoms and pathogens		
Practical Evaluation	Lab app	Isolation and Diagnosis of Aetiology	Applies steps to isolate and diagnose aetiology from infected plants	3	12
-	-	Med term	-	3	13
-	-	Field visit	-	3	14
-	-	Final Examination	-	-	15

11. Evaluation of the decision

Student performance in this course is assessed through multiple methods to ensure a thorough assessment of both theoretical knowledge and practical skills:

- Quizzes: Regular quizzes conducted throughout the semester to assess understanding of key concepts.
- Monthly exams: Midterm exams held at the end of the first and second semesters, the second months to assess cumulative learning.
- Practical Assessment: Direct assessment of students' laboratory and field diagnostics skills.
- Reporting and assignments: Practical reporting and assignments Demonstrate understanding of disease diagnosis and management.
- Participation: The assessment is based on active participation in class discussions and practical activities.
- Final Exam: A comprehensive final exam covering all subjects.

12. Sources of Learning and Teaching

Al-Ani, Sergeant Akif et al., 1989.Field cropsMinistry of Higher Education and Scientific Research,University of Baghdad,Beit Al-Hikma.	الكتب المنهجية -1
Kumar, M., & Chaurasiya, D. K. (2020). Infection of seed and transmission of seed borne pathogens. Res. Today, 2, 338-340. Carris, L. M., Castlebury, L. A., & Goates, B. J. (2006). Nonsystemic bunt fungi—Tilletia indica and T. horrida: a review of history, systematics, and biology. Annu. Rev. Phytopathol., 44(1), 113-133. Bán, R., Doshi, P., Berisha, A., Körösi, K., Kiss, J., Turóczi, G., ... & Nisha, N. (2025). Neem Leaf Extracts and Azadirachtin Trigger a Moderate Early Defense Response in Sunflowers Infected with Downy Mildew Caused by Plasmopara halstedii (Farl.) Berl. et de Toni. Agriculture, 15(12), 1248.	الكتب والمراجع الساندة التي يوصى بها
	Electronic references, websites ,.....

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نموذج وصف المقرر

1. Course Name					
Bee Breeding					
2. Course Code					
BEBR325					
3. Semester/year					
Y3					
4. Date this description was prepared					
2026 3/ 3 / 1					
5. Available attendance forms					
On a weekly basis					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30 hours/ 3.5 credits					
7. Course Administrator's Name (Mention All, If More Than One Name)					
Name: Prof. Dr. Hassanein Taher Karim + Dr. Hassan Hadi Faraj Email : Halhachami@uowasit.edu.iq					
8. Course Objectives					
*Introducing students to the external and physiological qualities of the honey bee insect, the qualities of the sect, the importance of breeding and care, and the most important requirements for the success of beekeeping . * Skills in managing beehives and diagnosing diseases and enemies of bees Control. Your health. *Introducing honey bee hive products and optimizing honey recipes ready for sorting .					
TEACHING AND LEARNING STRATEGIES					
Lecturing by asking questions and discussing them with students Use of teaching aids Microscopic examination of the insect's body, anatomy and identification of its structure Show models of insect internal organs Examining cells in the field, installing wooden cell parts and wax foundations, and identifying enemies diseases, cell division and multiplication					
6. Course Structure					
WE EK	Hours	Intended Learning Outcomes	Module / Course Name or	method of learning	Valuation method
1	5	A Definitio nal Preamble	Significance Economy of honey bees	Recognize the difference between individuals	Quis
2	5	Bee Breeds	The most important characteristics and areas of spread	See cell variations	Quis
3	5	External	Head ,chest, abdomen,	Sampling and	Quis

		Anatomy For your beaks.	appendages	Study At the laboratory	
4	5	Gastroint estinal	Accessories, digestion mechanics,apparatus ejection ,glands	Anatomy and watching Internal Devices	Quis
5	5	Circulati on... and respirato ry	Sections, Function	Anatomy and watching Internal Devices	Quis
6	5	Reprodu ctive system	Male, Female and Influencing Factors Competency	Anatomy and watching Internal Devices	Quis
7	5	Life of individua ls	Queen, worker and male	Special tools in The apiary and the installation of Parts and Importance	Quis
8	5	Life Phenome na	Crucifixion, false mothers, theft	Screening and Watching Cases	Quis
9	5	Construc tion of the apiary	The basic rules for the construction of the apiary, Foundations of Education	Protein nutrition And sugary	Quis
10	5	Queens producti on	Factors to Produce Standardized Queens	Raising Queens and Practicing A home- working process movements	Quis
11	5	Bee diseases	Bacterial and fungal diseases and unicellular viral	Disease Identification, Diagnosis and Treatment	Quis
12	5	Bees	Varroa parasite, wasp, waxworm, warbler etc..	Identifying, hunting and controlling pests on it.	Quis
13	5	- Flowers?	The Impact of Field Plants on Productivity and the Danger of	Examine cells and watch for damage to	Quis

			Poisonous Plants	toxic plants	
14	5	Pesticides	Its impact on bees and death Sudden	Screening for poisoned bees	Quis
15	5	Pests and diseases Al Dekheila	Nosema serana and the causes of cell deterioration, ways of transmission and control	Manufacture of extracts THERAPEUTICS	Quis
7. Course Evaluation					
Distribution of the score of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly and written examinations and reports etc.					
8. Learning and Teaching Resources					
Required textbooks (methodology if any)			1- Beekeeping and silkworm ,Louay Karmi Al-Naji 1980 2- Ali Abdul Baqi 2011		
Key References (Sources)			Letters and treatises about honeybees		
UNTRANSLATED_CONTENT_STA RT بها يوصى التي الساندة والمراجع الكتبالتقارير العلمية، المجالات UNTRANSLATED_CONTENT_END)			Al-Nahalal Al-Arabiya Magazine		
E-References , Websites			Journal of Apicultural Research Honey Bees and Beekeeping UGA Cooperative Extension		

Course Description Form

1. Name of the course
Theoretical land Reclamation
2. Course Code
LARE315
3. Term/ Year(2025-2026)
Third Stage
4. The date of preparation of this description
2025–26
5. Available attendance forms

Full time attendance	
6. Number of school hours (total/(number of units)total(	
5 hours 2) theoretical + 3 practical3(unit	
7. Name of the course officer (if more than one name is mentioned)	
Prof. Dr. Laith Salim Salman Eng. Yahya Radi	
8. Course Objectives	
1. Diagnosing and inventorying soil problems: Enabling the student to evaluate the land and identify the main reasons for its non-productivity (such as: salinization, alkalinity, low permeability, or soil sinking with groundwater). 2. Design and implementation of irrigation and drainage networks: Acquire the skill to plan and design agricultural drainage networks (exposed and covered) to get rid of excess water, and wash excess salts from the root zone. 3. Applying chemical and animal coefficients for reclamation: Knowing how to calculate and add chemical reformers (such as agricultural gypsum to treat alkaline soil), and organic and biological reformers to improve fertile soil construction. 4. Management and maintenance of reclaimed land: Studying methods of preserving land after reclamation and preventing the recession of salinization to it, through the selection of appropriate agricultural cycles and modern irrigation systems. 5. Combating desertification and erosion: Understand ways to protect soil from degradation and erosion (wind and water), establish windbreaks, and stabilize sand dunes to ensure the sustainability of agricultural projects.	Objectives of the Course
9. Teaching and Learning Strategies	
1. Laboratory Analysis: Practically training students to measure soil pH (\$pH \$), electrical conductivity (\$ EC\$) to estimate salinity, and calculate washing needs and gypsum doses based on real numbers. 2. Engineering Modeling and Simulation (Design & Simulation): Using simple maps and programs to assign students to design solid agricultural drainage networks (open and covered) and determine the appropriate distances and depths for drains. 3. Field visits to major projects (Field Trips): Visiting live sites of land reclamation companies, or areas suffering from salinization and wasteland, to see the mechanisms of soil washing, channeling, and laser levelling.	Strategy

• 4. Case Studies: Presenting a realistic land problem (for example: a desert pristine land, or a land that has deteriorated due to poor drainage), and assigning students to develop an integrated and economically feasible "road map" to reclaim it. • 5. Project-Based Learning: Dividing students into groups and providing them with "highly salted or alkaline" soil samples inside laboratory pots (Pots), and assigning them to process and wash them and plant a reagent plant in them to monitor the success of the reclamation process themselves.	
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10. Course Structure

Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Daily Examination	Lecture with an explanation of a presentation Introductory	Concept of Land Reclamation and its role in agricultural production .	Demonstrates the concept of reclamation	2	I
Daily Examination	Lecture with an explanation of a presentation Introductory	Methods of rehabilitating the soil affected by salt .	Explains land reclamation methods	2	2
Daily Examination	Lecture with an explanation of a presentation Introductory	Project Implementation Stages Rehabilitation of saline soil .	Identifies the stages of implementation of reclamation projects	2	3
Daily Examination	Lecture with an explanation of a presentation	Stage 1 /Surveys and Investigations Field .	Conducts surveys and investigations	2	4

	ion Introduct ory				
Daily Examination	Lecture with an explanati on of a presentat ion Introduct ory	Second stage Designs and Resolutions .	Prepares required accounts	2	5
Daily Examination	Lecture with an explanati on of a presentat ion Introduct ory	Third Stage	Carries out reclamation projects	2	6
Daily Examination	Lecture with an explanati on of a presentat ion Introduct ory	Stage 4 Farming .	Works on the cultivation of reclaimed areas	2	7
Daily Examination	Lecture with an explanati on of a presentat ion Introduct ory	Rehabilitated Education Department .	Can manage reclaimed soils	2	8
Daily Examination	Lecture with an explanati on of a presentat ion Introduct ory	The results of the experimentation of saline land reclamation in Iraq .	Performs experiments for reclamation	2	9

Daily Examination	Lecture with an explanation of a presentation Introductory	Rehabilitation of eutrophication .	Can reclaim sodic soils	2	10
Daily Examination	Lecture with an explanation of a presentation Introductory	Gypsum Rehabilitation	Can reclaim gypsum soils	2	11
Daily Examination	Lecture with an explanation of a presentation Introductory	Reclamation of Saharan soils And Ramliyah	Manages the reclamation of desert soils	2	12
Daily Examination	Lecture with an explanation of a presentation Introductory	Rehabilitation of college education .	Restores calcareous soil	2	13
Daily Examination	Lecture with an explanation of a presentation Introductory	Repairing the soil .	Manages swollen soil	2	14
Daily Examination	Lecture with an explanation of a presentation	Soil Rehabilitation Concept Acidification	Demonstrates the concept of acidic soils	2	15

	ion Introduct ory				
11. Evaluation of the decision					
Daily and quarterly tests + reports					
12. Sources of Learning and Teaching					
Ahmed Haider Al-Zubaidi.1989. Reclamation 1- Land Ministry of Higher Education. Basra University.			Required decision books (methodology, if any)		
Shafiq Ibrahim Abdel-Al and Amin Hamad Al-Rawi. 1981 Rehabilitation and improvement of the soil. Ministry of Education Higher education and scientific research. Sulaymaniyah University.			Main references (sources)		
There is no			Supporting books and references that are recommended for scientific fields, Reports (...)		
There is no			Online References, Internet Sites		

Course Description Form

1. Name of the course
Practical land reclamation
2. Course Code
LARE315
3. Term/ Year(2025-2026)
Third Stage
4. The date of preparation of this description

2025–26	
5. Available attendance forms	
Full time attendance	
6. Number of school hours (total/(number of units)total(	
5 hours 2) theoretical + 3 practical3(unit	
7. Name of the course officer (if more than one name is mentioned)	
Prof. Dr. Laith Salim Salman Eng. Yahya Radhi Karim	
8. Course Objectives	
1. Diagnosing and inventorying soil problems: Enabling the student to evaluate the land and identify the main reasons for its non-productivity (such as: salinization, alkalinity, low permeability, or soil sinking with groundwater). 2. Design and implementation of irrigation and drainage networks: Acquire the skill to plan and design agricultural drainage networks (exposed and covered) to get rid of excess water, and wash excess salts from the root zone. 3. Applying chemical and animal coefficients for reclamation: Knowing how to calculate and add chemical reformers (such as agricultural gypsum to treat alkaline soil), and organic and biological reformers to improve fertile soil construction. 4. Management and maintenance of reclaimed land: Studying methods of preserving land after reclamation and preventing the recession of salinization to it, through the selection of appropriate agricultural cycles and modern irrigation systems. 5. Combating desertification and erosion: Understand ways to protect soil from degradation and erosion (wind and water), establish windbreaks, and stabilize sand dunes to ensure the sustainability of agricultural projects.	Objectives of the Course
9. Teaching and Learning Strategies	
1. Laboratory Analysis: Practically training students to measure soil pH (\$pH \$), electrical conductivity (\$ EC\$) to estimate salinity, and calculate washing needs and gypsum doses based on real numbers. 2. Engineering Modeling and Simulation (Design & Simulation): Using simple maps and programs to assign students to design solid agricultural drainage networks (open and covered) and determine the appropriate distances and depths for drains. 3. Field visits to major projects (Field Trips): Visiting live sites of	Strategy

land reclamation companies, or areas suffering from salinization and wasteland, to see the mechanisms of soil washing, channeling, and laser levelling. • 4. Case Studies: Presenting a realistic land problem (for example: a desert pristine land, or a land that has deteriorated due to poor drainage), and assigning students to develop an integrated and economically feasible "road map" to reclaim it. • 5. Project-Based Learning: Dividing students into groups and providing them with "highly salted or alkaline" soil samples inside laboratory pots (Pots), and assigning them to process and wash them and plant a reagent plant in them to monitor the success of the reclamation process themselves.	
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10. Course Structure

Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Daily Examination	Lecture	Conducting an aquaculture experiment in the two bonds for a saline soil washed at various levels of salty water .	Applies experiments to reclaim land	3	1
Daily Examination	Practical experience	Conducting an aquaculture experiment in the two bonds for a saline soil washed at various levels of salty water .	Rehabilitates saline soils	3	2
Daily Examination	Lecture	Saline soil reclamation /implementation of reclamation program Saline culture	Implements a reclamation program	3	3
Daily Examination	Detailed explanation of the repair program	Implementation of the reform program Saline culture	Implements a sodic soil reclamation program	3	4

Daily Examination	Detailed explanation of pumps	Specifications of water pumps	Water Pumps	3	5
Daily Examination	Detailed explanation of the types of irrigation canals	Irrigation canals	Irrigation channels	3	6
Daily Examination	Detailed Explanation of Specifications Rehabilitated Education	Reclaimed land management	Can manage reclaimed land	3	7
Daily Examination	Detailed explanation of the management of each type	Reclaimed land management	Manages reclaimed land	3	8
Daily Examination	Detailed explanation of sand soil specifications	Reclamation of sandy land	Reclaiming sandy soils	3	9
Daily Examination	Detailed explanation of the sand soil repair method	Reclamation of sandy land	Reclaiming sandy soils	3	10
Daily Examination	Detailed Explanation of Exhausted Land Specifications	Reclamation of dilapidated land	Reclaiming swollen soil	3	11
Daily Examination	Detailed explanation Repair Methods Education	Reclamation of dilapidated land	Knows dusty soils	3	12
Practical report and discussion of the results	Evaluation of the trial Process and Outcome Discussion	Follow up on the practical trial	Follows up on experiments	3	13-14
11. Evaluation of the decision					
15-week lectures with monthly and daily examinations.					
12. Sources of Learning and Teaching					
Ahmed Haider Al-Zubaidi.1989. Repair 2-Land Ministry of Higher Education. Basra			Required decision books (methodology, if any)		

University.	
Shafiq Ibrahim Abdel-Al and Amin Hamad Al-Rawi. 1981 Rehabilitation and improvement of the soil. Ministry of Education Higher education and scientific research. Sulaymaniyah University.	Main references (sources)
There is no	Supporting books and references that are recommended for scientific fields, Reports (...)
There is no	Online References, Internet Sites

Course

1. Course Name:
Cereal crops
2. Course Code
CECR313
3. Semester: Autumn/ Year : (2025-2026)
Chapter One/Phase Three
Date of preparation of this description:
2025–26
5. Available attendance forms:
Full time attendance
.63.5 Number of school hours (total) 30 hours / number of units (total)
75 total hours, 5 hours per week for 15 weeks
7. Name of the course officer (if more than one name is mentioned)
Prof. Riyad Jabbar Mansour M.M. Balqis Mohsen Sultan Eng. Hussein Tohma Abboud
Providing the student with practical and theoretical information to know the environmental and agricultural requirements of cereal crops.8 Objectives of the course - To enable the application of the scientific foundations for the management of cultivated fields in field crops

1. Work on the graduation of the application with a valuable interest in the field of good production of the financial statements 2. Defining the application in terms of the financial statements, the nature of its development, the methods of its production, its distribution and its employees and its shares. 3- The definition of the student in the nature of dealing with the research and research used in the field of crop production. 4- Definition of the application by the equipment used in the laboratory used in the examination of seeds					Objectives of the Course
9. Teaching and Learning Strategies					
Highlight appropriate learning strategies for this course briefly: 1. Field Monitoring: Accompanying the crop in the field through its critical growth stages (germination, branching, elongation, expulsion, and maturation) to link the external appearance to service and irrigation requirements. 2. Investigation to estimate the components of the yield (Yield Components Analysis): Practically training students to calculate the prediction of productivity before harvest by random sampling and calculating (the number of spike/square meter, the number of grains/spike, and the weight of 1000 grains). 3. Project-Based Learning: Assigning students (in groups) to manage a complete production plan for a particular grain crop, from variety selection and planting date to harvesting and marketing. 4. Quality Lab Testing: Conducting laboratory experiments to determine the suitability of grains for processing, such as protein ratio tests, gluten testing in wheat (for baking bread), or milling clarification in rice.					Strategy
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Tests Daily and Monthly	Point Power Lecturer	The Economic Importance of Grain Populations in Iraq and the World	Determine importance of grain crops	2	1
Short quizzes	Lecture	Centers for the emergence of cereal crops in the world - the productivity of cereal crops in Iraq and the reasons for its decline	Identifying Global Emergence Centers	2	2

You are on my side, aren't you?	Focus group discussions	Producer of wheat - Important Economics of Plant Description of Requirements Environmental-Agricultural Requirements –	Describe the wheat crop	2	3
Practical Evaluation	self-education	Recession and stagnation - production elements in cereal crops	Addresses the problem of lying in grain crops	2	4
		Examination -1-		2	5
Focus group discussions	Lecture + Discussion	Proceeds of thereye-importance Economics of plant prescribing-environmental requirements - agricultural requirements	Determines the importance of the barley crop	2	6
Tests Daily and Monthly	Lecture + Reports	Chaireur Outcome - Important Economics of Plant Description of Requirements	Distinguish between wild and crop types of oats	2	7
Short quizzes	Classroom Discussions	Chilim Outcome - Important Economics of Plant Description of Requirements	Diagnosis of the importance of rye crop	2	8
storage	Self-learning + report discussion	Rice Produce- Importance Economics of Plant Description of Requirements Environmental-Agricultural Requirements –	Determine economic importance of rice	2	9
		Examination -2-		2	10
Short questions	Focus group discussions	The Outcome of the Yellow Corn - Economic Importance The Plant Description of theRequirements Environmental-Agricultural Requirements –	Determine corn crop requirements	2	11

Discussion of a report	self-education	White Corn Outcome - Economic Significance-Requirements Environmental-Agricultural Requirements – Ripening and Harvesting	Distinguish between white and yellow corn in terms of plant description	2	12
Live Review	Lecture + Discussion	Smoking product-importance Economics of Plant Description of Requirements Environmental-Agricultural Requirements –	Explains the importance of the millet crop	2	13
		Examination -3-			14
	Lecture + Reports	Production of wheat seeds	Determines the basic standards for seed production		15
According to the tasks assigned to them, such as daily preparation and daily, oral and monthly examinations 30 Degree distribution of Editorial and reporting ... Etc.					
12. Sources of Learning and Teaching					
There is no			Required decision books (methodology, if any)		
Cereal and pulses crops –Talif Nabil Ali Khalil ,Al-Mutawalli Abd Al-Mutawalli , MajdiMohammed Shafiq, andJ 'Abd al-'Aḍīm al-Murshidī .Faculty of Agriculture – Cairo University. 2015 3- Production and improvement of field crops (Part I) Abdulhamid Ahmed . University , University of Baghdad - Faculty Agriculture , 1993-4 Principles of Production of Field Crops Mohammed Kazem Al-Baldawi and Alaa Al-Din Abdul Majid Al-Jabri and Muwafaq			Main references (sources)		
There is no			Supporting books and references that are recommended forscientific fields, Reports (...)		

There is no	Online References, Internet Sites
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Course Description Form

1. Name of the course	
Cereal crops -Phase III - Department of Fields/Faculty of Agriculture	
2. Course Code	
CECR313	
3. Term/ Year	
Chapter One/Phase Three (2025-2026)	
4. The date of preparation of this description	
3 August 2025	
5. Available attendance forms	
Full time attendance	
6. Number of school hours (total/(number of units)total(	
5 hours per week 2) theoretical hours 3+ operational hours (3.5-unit	
7. Name of the course officer (if more than one name is mentioned)	
Prof.Dr. Riyad Jabbar Mansour Eng. Balqis Mohsen Sultan Eng. Hussein Tohma Abboud	
8. Course Objectives	
Identifying the methods of cultivating each crop and the factors affecting the productivity of each Produced Methods used in the storage and marketing of cereal crops of interest in the world Knowledge of the plant description of each field crop Making reports on specific field crop utilization issues	Objectives of the Course
9. Teaching and Learning Strategies	
The most prominent learning strategies suitable for this course in short: • 1. Field Monitoring: Accompanying the crop in the field through its critical growth stages (germination, branching, elongation, expulsion, and maturation) to	Strategy

link the external appearance to service and irrigation requirements. • 2. Investigation to estimate the components of the yield (Yield Components Analysis): Practically training students to calculate the prediction of productivity before harvest by random sampling and calculating (the number of spike/square meter, the number of grains/spike, and the weight of 1000 grains). • 3. Project-Based Learning: Assigning students (in groups) to manage a complete production plan for a particular grain crop, from variety selection and planting date to harvesting and marketing. • 4. Quality Lab Testing: Conducting laboratory experiments to determine the suitability of grains for processing, such as protein ratio tests, gluten testing in wheat (for baking bread), or milling clarification in rice.	
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10. Course Structure

Assessment Method	Learning Method	Name of the unit or subject	Outputs learning	Hours	Weeks
Short quizzes	Illustrative lecture with Models	Plant division of cereal crops	divides crops morphologically	3	1
Short quizzes	Illustrative lecture with Models	Stages of growth of granular crops	GROWTH PHASES	3	2
Short quizzes	Illustrative lecture with Models	Methods of grain storage	Diagnose storage methods	3	3
Short quizzes	Illustrative lecture with Models	Description of the wheat crop	Describe the wheat crop	3	4
Short quizzes	Illustrative lecture with Models	Vegetative description of the barley product	Describes the barley crop	3	5
		First Month Examination		3	6
Short quizzes	Illustrative lecture with Models	Vegetable Description of the Rice Crop	Describes the barley crop	2	7

		Second Month Examination		3	8
Short quizzes	Illustrative lecture with Models	Vegetative Description of the Yellow Maize Outcome	Describes the crop of calves	3	9
Short quizzes	Illustrative lecture with Models	Botanical description of the yield of the white corn	Distinguish between sorghum and yellow corn	3	10
Diagnosis models	Illustrative lecture with Models	Vegetative description of the product	Describes the harvest of choufat	3	11
Visit Scattering	Orientation Lecture	Visit the Seed Certification Authority	See seed germination methods	3	12
		Monthly Examination 3		3	13
Short quizzes	Illustrative lecture with Models	Vegetable Description of the Shaleem Producer	Rye	3	14
Short quizzes	Illustrative lecture with Models	Vegetarian Description of the Smoking Product	millet	2	15
11. Evaluation of the decision					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations Editorial and reporting ... Etc.					
12. Sources of Learning and Teaching					
Cereal and pulses crops (practical part) , d. 1- Kamel Mohammed Al-Khafaji , University of Baghdad 2009			Required decision books (methodology, if any)		

Production of cereal crops . Prof. Dr. Abdulhamid Mohammed 1. Hassan , Faculty of Agriculture – Al-Azhar University,	Main references (sources)
Scientific journals	Supporting books and references that are recommended in the journals Scientific, Reports (...)
Some research and articles on grain	Online References, Internet Sites

Course

Fourth Stage

Study of

1. Name of the course	
Drug plants	
2. Course Code	
DRPL411	
3. Term/ Year	
First Semester / 2025-2026	
4. The date of preparation of this description	
1/9/ 2025	
5. Available attendance forms	
Full time (theoretical lecture/practical lecture	
6. Number of school hours (total/(number of units)total(	
5 hours per week for 14 weeks	
7. Name of the course officer (if more than one name is mentioned)	
Name : Prof. Dr. Ahmed Shaker Mohsen Eng. Moataz Abdelkazem Email : ahshaker@uowasit.edu.iq	
8. Course Objectives	
- Introducing the student to the economic and medical importance of medicinal and aromatic plants. - Enabling the student to classify medicinal plants based on the active ingredients and therapeutic importance. - Understand the vital pathways for the synthesis of active substances (secondary metabolism) and the influence of environmental and genetic factors on them. - Providing the student with practical skills in methods of harvesting, drying, and storing medical drugs to ensure their quality. - Training the student on modern techniques for extracting volatile oils and active substances and estimating them laboratory.	اهداف المادة الدراسية
9. Teaching and Learning Strategies	

• Theoretical Lectures: Using Presentations (PPT) and Vital Pathways Diagrams. • Practical aspect: Laboratory investigation through direct extraction and distillation experiments. • Self-learning: Assigning students to make a botanical herb for common medicinal plants or reports on specific drugs. • Brainstorming: Linking the active substance to industrial and medical use in our daily lives.	Strategy
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10. Course Structure

Assess ment Method	Learning Method	Name of the unit or subject	Learning outcomes	Hours	Week
Daily quiz	Lecture + Sample Show	Introduction to Medicinal Plants and their Classification	Introducing the student to what drug plants are	2	I
Laborato ry report	Discussion + Classification Lab	Division of plants by therapeutic significance	Understand the criteria for chemical and industrial partitioning	2	2
Class discussio n	Lecture + Physical Examination	Volatile oils and industrial use	Distinguish between types of oils and their composition	2	3
Quiz	Lecture + Genie Lab	Alkaloids and Medically Used Parts	Understand the role of alkaloids and leprechaun times	2	4
Practical Skill Assessm ent	PRESENTATI ON	Clycosides and product quality standards	To know about the Clycosides and the cleanliness of the product	2	5
Daily quiz	Lecture + Color Experiments	Tannins and Aromatic Physical Qualities	Study of tannins and chemical qualities	2	6
Beneficia ry experien ce report	Explanation of diagrams + distillation	Biopath and Distillation Methods	Understand how the active substance is constructed internally	2	7
PRACTI CAL EXAMIN ATION	Field + Laboratory Application	Plant cultivation and oil extraction methods	Mastering the methods of multiplication and extraction	2	8
PRACTI CAL EXAMIN ATION	Brainstorm	- Factors Affecting Growth	Analysis of the impact of climate and soil on production	2	9

Medical Evaluation	Lecture + Extraction Experiment	Genetic factors and solvent extraction	Linking Genetics to Productivity and Extraction	2	10
marking of examination papers	Written exam + application	Theoretical exam + modern extraction methods	Cognitive and Technical Achievement Assessment	2	11
test (oral-)	Preservation of herbal samples	Scientific Names and Growth Environment	Memorizing the scientific names of some samples	2	12
Rate a post	agrarian, field	Date picking and examples of aromatic plants	Determine physiological maturity and economic picking	2	13
FINAL REPORT	View Stored Forms	Storage conditions and forms of prescription drugs	Mastering the arts of storage and preserving the material	2	14
Final Examination	Practical training	Extractors and estimators of active substances	Ability to use advanced devices	5	15

11. Evaluation of the decision

- Editorial Exams: Monthly and Final
- Daily, monthly tests.
- Research Reports
- Activism and engagement

12. Sources of Learning and Teaching

• <i>Trease and Evans Pharmacognosy</i> (William Charles Evans). • <i>Fundamentals of Pharmacognosy and Phytotherapy</i> (Heinrich et al.).	Global Reference Books
• Drug Plants and Traditional Medicine (Dr. Ibrahim Al-Jamal • Production of medicinal and aromatic plants (contemporary Arabic literature in agricultural sciences	Arabic references :
• ScienceDirect (research into secondary metabolic pathways). • World Medicinal Plants Database (WMPD)	Digital Resources and Databases

Illustrative videos of the Soxhlet extraction process and the Steam Distillation process.	Educational Videos
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1. Name of the course
Practical Plant drugs
2. Course Code
DRPL411
3. Term/ Year
First/Fourth Stage/2025-2026
4. The date of preparation of this description
1/9/ 2025
5. Available attendance forms
My presence in the Fools' Laboratory
6. Number of school hours (total/(number of units)total(
3) Hours of work(3 units)
7. Name of the course officer (if more than one name is mentioned)
Eng. Hadeel Hamza Ali Eng. Abdul Kazem Shaker
8. Course Objectives

Through the course of treatment of diseases and pathogens, the importance of the medicinal and stimulant drugs in the treatment of diseases and pathogens and what is different from the chemical drugs is identified The course is also concerned with studying the environmental factors that affect their production and how to diagnose the active compounds in these plants, and the most important chemical groups and important active compounds are indicated in the most common plants used as impediments Importance of Medicinal Plants and How to Maintain Them Knowing the Types and Benefits of Medicinal Plants and How to Use Them More How to Maintain and Improve Them Distinguishing Between Medicinal Plants and How to Use Them How to Use Them How to Use Them How to Use Them More	Objectives of the Course				
9. Teaching and Learning Strategies					
Weekly reports Field Applications					Strategy
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Daily quiz	Lecture with an explanation of a presentation Introductory	Overview and definition of medical drugs and identification of sources of medical drugs	medicinal plants	3	I
Laboratory report	Lecture with an explanation of a presentation Introductory	Identify the factors that affect medical plants, including light, intensity of illumination, temperature and their impact	Identifies factors affecting medicinal plants	3	2

Class discussion	Lecture with an explanation of a presentation Introductory	Geological climatic factors, including water and the effects of increased humidity lack of them and how they affect me	Identifies climatic and geological factors affecting medicinal plants	3	3
Quiz	Lecture with an explanation of a presentation Introductory	Geological/soil factors and their natural composition –Ventilation - Salts in the soil – Industrial factors, including irrigation, fertilization, reproduction, cultivation methods and distance between Plants	Identifies climatic and geological factors affecting medicinal plants	3	4
Practical Skill Assessment		First Month Examination.		3	5
Daily quiz	Lecture with an explanation of a presentation Introductory	Methods and dates of collecting the proceeds of a financial visit to the field	Determines the dates of planting medicinal crops	3	6
Beneficiary experience report	Lecture with an explanation of a presentation Introductory	Genetic factors/ mutations/ genetic duplication /hybridization	Genetics	3	7
PRACTICAL EXAMINATION	Lecture with an explanation of a presentation	Preparation of medical plants For marketing	Prepares medicinal plants for marketing	3	8

	Introductory				
Display screen	Lecture with an explanation of a presentation Introductory	Drying of medicinal plants and drying types	Dries medicinal plants and knows the types of drying	3	9
		Second Month Examination		3	10
. Course Evaluation					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily and oral examinations Monthly, editorial and reporting... Etc.					
12. Sources of Learning and Teaching					
There is no			Required decision books (methodology, if any)		
There is no			Main references (sources)		
There is no			Supporting books and references that are recommended for scientific fields, Reports (...)		
Lectures from online sites			Online References, Internet Sites		

1. Name of the course
Plant Physiology
2. Course Code
PLPH412
3. Term/ Year
Chapter One/Phase Four 2025-2026
4. The date of preparation of this description

1/9					
5. Available attendance forms					
Full time attendance					
6. Number of school hours (total/(number of units)total(					
5 hours per week 2 (theoretical hours 3+ operational hours) / 3.5 units					
7. Name of the course officer (if more than one name is mentioned)					
Prof. Nabil Rahim Lahmoud nraheem@uo wasit.edu.iq M. M. Wamid Majeed Ali					
8. Course Objectives					
• To know the physics of plants and the sciences associated with • Identification of the cell and its parts and functions each part • Know the relationship between the plant and the outer perimeter • Identify the physiological activities that occur in plants and their mechanisms of action • Knowing the impact of environmental stress and its impact on plants • Plant Growth Regulators Impact Identifier					
9. Teaching and Learning Strategies					
Cooperative education Education in projects Field Visits Self-learning					Strategy
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introductory	Plant Cell	The student should understand the components of the plant cell and the function of each of them	2	1

Daily quizzes + group discussions	Lecture with an explanation of a presentation Introductory	Water Effort in Plant Cells Water absorption	Distinguish between water voltage, osmotic and swelling pressure	2	2
Discussion of reports	Lecture with an explanation of a presentation Introductory	The rise of water in the wood tissue Water transport vehicles	Recognizes how water rises in wood	2	3
Field visit	Lecture with an explanation of a presentation Introductory	The result of the creation of gaps in the factors affecting the movement Gaps	Knows the transpiration process and determines its benefits to the plant	2	4
Daily quizzes + group discussions					5
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introductory	Photostructure Photostructure Chromosomes	Knows photosynthesis and the pigments involved	2	6
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introductory	Interactions of light construction Lighting Interactions Dark Interactions	Understands photosynthetic interactions and their mechanisms	2	7
Daily quizzes + group discussions	Lecture with an explanation of a presentation	Interactions of darkness and plant species	Distinguish between C3 and C4 plants	2	8

	ion Introduct ory				
Discussion of reports	Lecture with an explanation of a presentation Introduct ory	Plant Breathing Process	Understands the process of breathing in a plant and its stages	2	9
Field visit	Lecture with an explanation of a presentation Introduct ory	Organisations for plant growth	Knows the types of plant growth regulators	2	10
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introduct ory	Plant growth and development	Understands plant evolution and growth	2	11
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introduct ory	Photophylaxis in plants	Knows light and anaphylaxis and how it happens	2	12

Daily quiz	Lecture with an explanation of a presentation Introductory	Biological stress on plants	Determines plant behavior under stress conditions	2	13
Midterm 2					14
11. Evaluation of the decision					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations Editorial and reporting ... Etc.					
12. Sources of Learning and Teaching					
			Required decision books (methodology, if any)		
Plant Physiology. Author: Prof. Dr. Abdul Jabbar NasserAl-Zubaidi. Plant Physiology. Authors: Lincoln Taiz and Eduardo Zeiger.			Main references (sources)		
-Hans Mohr & Peter Schopfer. Plant Physiology. Springer-Verlag, Latest Edition. William G. Hopkins & Norman P. A. Hüner. Introduction to Plant Physiology. John Wiley & Sons, Latest Edition.			Supporting books and references that are recommended in the journals Scientific, Reports (...)		
.American Society of Plant Biologists (ASPB) - Plant Physiology (Oxford Academic) Food and Agriculture Organization of the United Nations (FAO)			Online References, Internet Sites		

Study of

1. Name of the course
Plant Physiology /Practical
2. Course Code
PLPH412
3. Term/ Year

2025-2026					
4. The date of preparation of this description					
02/02/2026					
5. Available attendance forms					
6. Number of school hours (total/(number of units)total(					
3 hours per week for 15 weeks/ 1					
7. Name of the course officer (if more than one name is mentioned)					
Eng. Wamid Majeed Ali					
8. Course Objectives					
• This course aims to • Introducing the student to the basic concepts of plant physiology and the study of plant physiology • Understand the nature of the media and solutions (real, suspended, and colloidal) in which biological reactions take place within the plant cell • Identify the physical and chemical properties of water and its role in physiological processes • Providing the student with practical skills in preparing solutions and calculating their different concentrations • The study of physical phenomena associated with plant life such as diffusion, osmosis, and plasmapheresis through laboratory experiments.					
9. Teaching and Learning Strategies					
• Hands-On Lectures: Brief Theoretical Explanation Supported by Powerpoint Demonstrations • Laboratory experiments: implementation of direct practical experiments by students to consolidate concepts • Scientific discussion: Discussing the results of experiments and linking them to the physiological reality of the plant • Self-learning: Preparing periodic reports on laboratory results and interpreting them scientifically.					
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning outcomes	Hours	Week
Daily Quizzes Discussion	Hands-on Lecture Microsoft	General introduction and types of solutions	Understand the basic concepts and nature of solutions	3	1

	PowerPoint	(real, stuck, colloidal)			
Daily Quizzes Discussion	Hands-on Lecture Microsoft PowerPoint	Water and its polar and physical properties	Knowing the properties of water and its vital importance	3	2
MATH PROBLEMS:	PRACTICAL TRAINING	Methods of expressing the concentration of solutions (M, N, ppm)	Acquiring the skill of preparing chemical concentrations	3	3
Daily Quizzes Discussion	Hands-on Lecture Microsoft PowerPoint	Colloids and their properties	Understanding the characteristics of colloidal systems in the cell	3	4
Beneficiary experience report	laboratory experiment	Tendall's Phenomenon, Brownian Motion, and Electrical Properties	Observation of visual and electrical phenomena of colloids	3	5
Month 1					6
Discussion :	Hands-on Lecture PowerPoint + Experience	Diffusion in gases and liquids	Understanding the movement of molecules and the factors affecting them	3	7
Laboratory report	It's practical work.	Diffusion of solids and diffusion through gelatin	Observation of diffusion in solid media	3	8
Daily Quizzes Discussion	Hands-on Lecture Microsoft PowerPoint	Osmosis and osmotic potential	Understanding the movement of water across membranes and osmotic pressure	3	9
Beneficiary experience report	It's practical work.	Experimenting with osmosis using potato chunks	Applying osmotic concepts to plant tissues	3	10
Scientific discussion	Microscopic	Plasmolysis and healing	Understand the cell's response to different solutions	3	11

	experiment				
Daily Quizzes Discussion	PowerPoint Lecture	The importance of osmosis and diffusion (water absorption, ostomy opening)	Recognize the importance of physical phenomena in plant life	3	12
Skill Assessment	PRACTICAL TRAINING	pH measurement and use of pH meter	Be able to measure acidity in plant media	3	13
Second Month Exam					14
Reporting Assessment	Panel Discussion	General review and delivery of final reports	Completion of course requirements	3	15
11. Evaluation of the decision					
Daily , monthly exams Discussion Questions Sharing Scores					
12. Sources of Learning and Teaching					
Basics of Plant Physiology 1991 Three Parts Fundamentals of Plant Physiology 2001			Required textbooks		
The Book of Plant Philosophy by Dr.Mohammed bin Hamad Al-Wahaibi			الكتب والمراجع الساندة التي يوصى بها		
https://www.youtube.com/ @ aa.a.1390.a.a.a			Electronic references, websites ,.....		

1. Name of the course					
Weed Biology					
2. Course Code					
WEBI413					
3. Term/ Year					
Chapter One/Phase Four/2025-2026					
4. The date of preparation of this description					
1-10-2025					
5. Available attendance forms					
Full time attendance					
6. Number of school hours (total/(number of units)total(					
Five hours per week (three working hours + two theoretical hours) / 3 units					
7. Name of the course officer (if more than one name is mentioned)					
Dr. Hussein Ibrahim Tarish Eng. Moataz Abdelkazem					
8. Course Objectives					
Identify the spreads in the region Knowledge of the propagation of propaganda Knowing how to keep and keep the models			Objectives of the Course		
9. Teaching and Learning Strategies					
The lesson includes (2 theoretical hours) and (3 practical hours) the number of approved weekly hours Distributed over 15 weeks					Strategy
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning Outcomes service.	Hours	Week
Daily Quizzes	Lecture with an explanation of a presentation	Historical overview of the advertisement	Recognizes the stages of development of jungle science	2	I

	n Introductor y				
Field tours	Lecture with an explanation of a presentation Introductor y	Classification of adulteration plants	Classifies bush plants	2	2
Discussion of reports	Lecture with an explanation of a presentation Introductor y	Characteristics of the Unsullied	Distinguish the types of jungles	2	3
You are on my side, aren't you?	Lecture with an explanation of a presentation Introductor y	The green traits of all the vegetative models For prostitutes	Collects forms to save	2	4
Semi-Quarterly Test	Lecture with an explanation of a presentation Introductor y	First Month Examination		2	5
Daily Quizzes	Lecture with an explanation of a presentation Introductor y	Characteristics of adulteration plants	Specifies the specifications of bush plants	2	6
Field tours	Lecture with an explanation of a presentation Introductor y	Vegetative Density Study	Determines the influential population density of the jungle	2	7

Discussion of reports	Lecture with an explanation of a presentation Introductory	Method of studying vegetable cover	Botanical study	2	8
You are on my side, aren't you?	Lecture with an explanation of a presentation Introductory	Sampling Methods	Can take samples correctly	2	9
Daily Quizzes	Lecture with an explanation of a presentation Introductory	Foam spraying equipment	Uses spraying equipment correctly	2	10
Field tours	Lecture with an explanation of a presentation Introductory	Methods of Combating Fraud	Fighting the bush in the field	2	11
Discussion of reports	Lecture with an explanation of a presentation Introductory	Use of chemical pesticides	Uses pesticides safely	2	12
You are on my side, aren't you?	Lecture with an explanation of a presentation Introductory	Natural and chemical traits For Fraudulent Pesticides	Describes the appropriate exterminator	2	13
Daily quiz	Lecture with an explanation	Adverse effects of pesticides (Soil and	Determines the effect of the pesticide on the	2	14

	of a presentation Introductory	environmental types of sprinklers)	soil and plant		
Semi-Quarterly Test		Second Month Examination			15

11. Evaluation of the decision	
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily and oral examinations Monthly, editorial and reporting... Etc.	
12. Sources of Learning and Teaching	
The book of publicity and ways of combating it/ Dr. Mohamed Hadhal Kazim Al-Badawi	Required decision books (methodology, if any)
Al-Daghool fi Al-Araq Book	Main references (sources)
A systematic book to combat propaganda	Supporting books and references that are recommended for scientific fields, Reports (...)
There is no	Online References, Internet Sites

1. Name of the course
Weed Biology practical
2. Course Code
WEBI413

3. Term/ Year					
2025/2026					
4. The date of preparation of this description					
1-10-2025					
5. Available attendance forms					
Full time attendance					
6. Number of school hours (total/(number of units)total(					
3) Hours of work(3 units)					
7. Name of the course officer (if more than one name is mentioned)					
Prof. Dr. Hussein Ibrahim Tarish M. M. Moataz Abdelkazem					
8. Course Objectives					
Identification of vegetative traits and means of propagation of adolescent plants and identification of methods of preserving and drying vegetative models and adolescent types according to the growth season and according to Life Cycle			Objectives of the Course		
9. Teaching and Learning Strategies					
Lesson 3 (practical hour) includes the number of approved weekly hours distributed over 15 weeks					Strategy
10. Course Structure					
	Learning Method	Name of the unit or subject	Outputs UNTRANSLATED_CONTENT_START UNTRANSLATED_CONTENT_END	Hours	Week
Daily Quizzes	Lecture with an explanation of a	Introduction to Fraud	Definition of Jungle	3	I

	presentation Introductory				
Field tours	Lecture with an explanation of a presentation Introductory	Classification of adulteration plants	Jungle Classification	3	2
Discussion of reports	Lecture with an explanation of a presentation Introductory	Apparent Attributes For prostitutes	Specification of the bush plant	3	3
You are on my side, aren't you?	Lecture with an explanation of a presentation Introductory	Green traits For prostitutes	Characteristics of the bush	3	4
		First Month Examination	Knowledge evaluation	3	5
Daily Quizzes	Lecture with an explanation of a presentation Introductory	Collecting the vegetarian models of the idiosyncratic Fraudulent plants	He can collect models	3	6
Field tours	Lecture with an explanation of a presentation Introductory	Vegetative Density Study	characterizes the harmful density of the jungle	3	7

	y				
Daily Quizzes	Lecture with an explanation of a presentation Introductory	Cover Study Method Vegetarian	Can identify bush vegetation	3	8
Field tours	Lecture with an explanation of a presentation Introductory	Sampling Methods	Can take samples	3	9
Discussion of reports	Lecture with an explanation of a presentation Introductory	Pesticide spraying equipment Fraudulence	Uses spraying equipment	3	10
You are on my side, aren't you?	Lecture with an explanation of a presentation Introductory	Types of sprinklers	Distinguish between types of sprinklers	3	11
		Second Month Examination			12
11. Evaluation of the decision					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily and oral examinations Monthly, editorial and reporting... Etc.					
12. Sources of Learning and Teaching					

The book of propaganda and ways to combat it - the practical part. Dr. Mohammed This is Kadhim Al-Baldawi Conciliator Abdul Razzaq	Required decision books (methodology, if any)
There is no	Main references (sources)
There is no	Supporting books and references that are recommended for scientific fields, Reports (...)
There is no	Online References, Internet Sites

Course Description Form

1. Name of the course
Pastoral Management
2. Course Code
PAMA424
3. Term/ Year
Chapter Two
4. The date of preparation of this description
1/2/2026
5. Available attendance forms
Full time attendance
6. Number of school hours (total/(number of units)total(
5hours per week 2) theoretical hours 3+ operational hours (3- units
7. Name of the course officer (if more than one name is mentioned)

Prof. Dr. Hakim Sultan Abdul Eng. Wamid Majeed Ali						
8. Course Objectives						
Identify the types of pastoralists Determining the global pastoral areasand the pastoral areas in Iraq Importance of pasture Factors Affecting Pastoralism Learn about the herding system Identification of harmful areas				Objectives of the Course		
9. Teaching and Learning Strategies						
The course includes (2) theoretical hours and (3) practical hours - the number of approved weekly hours distributed to 15 weeks .					Strategy	
10. Course Structure						
Assessme nt Method	Learning Method	Name of the unit or subject		Outputs learning	Hours	Week
Daily Quizzes	Lecture with an explanation of a presentation	Rangelands and their varieties		Enumerat es the types of rangeland s	2	I
Focus group discussio ns	Lecture with an explanation of a presentation	Economic Importance of Rangelands		Defines the economic importanc e of rangeland s	2	2
تعليم تعاوني 19.	Lecture with an explanation of a presentation	Pastoral vegetarianism and its basic components		Knows vegetative cladding and its compone nts	2	3
self- educatio n	Lecture with an explanation of a presentation	Natural environmental and pastoral factors			2	4
Daily Quizzes	Lecture with an explanation of a	Plants and pastoral areas in the world		Identifies grazing areas in Iraq	2	5

	presentation				
Focus group discussions		First Semester Examination		2	6
تعليم تعاوني 19.	Lecture with an explanation of a presentation	Plants and pastoral areas in Iraq	Identifies grazing areas in Iraq	2	7
self-education	Lecture with an explanation of a presentation	Herdsman and His Spouse	Shows the impact of grazing	2	8
Daily Quizzes	Lecture with an explanation of a presentation	Types of Shepherding System	Distinguish between types of grazing systems	2	9
Focus group discussions	Lecture with an explanation of a presentation	Animal load and its determinants	Determines the animal load of the pasture	2	10
تعليم تعاوني 19.	Lecture with an explanation of a presentation	Sources of exploitation for pastoral plants	Know the sources of plant exploitation	2	11
self-education	Lecture with an explanation of a presentation	Pasture Management and Maintenance	Identifies methods of rangeland maintenance	2	12
تعليم تعاوني 19.	Lecture with an explanation of a presentation	Harmful Scrubs in Natural Rangelands	Identify harmful species of bush	2	13
		Second Term Examination		2	14
11. Evaluation of the decision					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations					

Editorial and reporting ... Etc.	
12. Sources of Learning and Teaching	
Lectures from online sites	Required decision books (methodology, if any)
There is no	Main references (sources)
There is no	Supporting books and references that are recommended in the journals Scientific, Reports (...)
There is no	Online References, Internet Sites

1. Name of the course
Practical Pastoral Management
2. Course Code
PAMA424
3. Term/ Year
2025/2026
4. The date of preparation of this description
1/2/2026
5. Available attendance forms
Full time attendance
6. Number of school hours (total/(number of units)total(
3) Hours of work(3 units)
7. Name of the course officer (if more than one name is mentioned)

Eng. Wamid Majeed Ali					
8. Course Objectives					
Identification of natural factors and identification of the most important plants Natural rangelands			Objectives of the Course		
9. Teaching and Learning Strategies					
Lesson 3 (practical hour) includes the number of approved weekly hours distributed over 15 weeks				Strategy	
10. Course Structure					
Assessme nt Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Daily Quizzes	Lecture with an explanati on of a presentat ion Introduct ory	Natural Factors Affecting Pastoral-Environmental Factors and soil factors	Enumerates the factors affecting rangelands	3	1
Daily Quizzes	Lecture with an explanati on of a presentat ion Introduct ory	Bio Factors, Fire Factors, and Situational Factors	Enumerates the types of local and life factors	3	2
Field visit	Lecture with an explanati on of a presentat ion Introduct	Components of vegetable cladding in Mardi Gras	Explains the components of vegetative cladding	3	3

	ory				
Diagnosis models	Lecture with an explanation of a presentation Introductory	The impact of the pastoralist on the productivity of the pastoralist plants - The impact of the pastoralist on the breeding of the intensity of the pastoralist and the impact of the pastoralist on the reproduction of the plants Pastoralism	Explains the impact of grazing on the natural plant	3	4
		First Month Examination		3	5
Daily Quizzes	Lecture with an explanation of a presentation Introductory	Effects of Pastoralism in Synthesis Vegetarian Clothing	Illustrates the effect of grazing on plant structure	3	6
Field visit	Lecture with an explanation of a presentation Introductory	The relationship of grazing plants to soil and water conservation	Shows the relationship between plant and soil maintenance	3	7
Diagnosis models	Lecture with an explanation of a presentation Introductory	Restoration of natural and industrial cladding for degraded rangeland land	Determines the methods of re-vegetation	3	8

	ory				
Daily Quizzes	Lecture with an explanation of a presentation Introductory	Reasons for degradation of rangelands and ways to improve rangelands	Addresses rangeland degradation	3	9
Field visit	Lecture with an explanation of a presentation Introductory	Types of pastoral plants and trees growing in pastures Iraqi	Determines the types of pastoral trees suitable for Iraqi conditions	3	10
Diagnosis models	Lecture with an explanation of a presentation Introductory	Harmful and poisonous plants in Pasture lands	Identifies types of harmful plants	3	11
Daily Quizzes	Lecture with an explanation of a presentation Introductory	Blowing, Causes and Knocking Abandonment of	Prevents animal bloating	3	12
Daily Quizzes	Lecture with an explanation of a presentation Introductory	Natural Factors Affecting Pastoral-Environmental Factors and soil factors	Enumerates the natural factors affecting the environment and soil of rangelands	3	13
Field visit	Lecture with an explanation of a	Bio Factors, Fire Factors, and Situational Factors	Identifies life and fire factors	3	14

	presentation Introductory				
		Second Month Examination		3	15
11. Evaluation of the decision					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily and oral examinations Monthly, editorial and reporting... Etc.					
12. Sources of Learning and Teaching					
There is no			Required decision books (methodology, if any)		
There is no			Main references (sources)		
There is no			Supporting books and references that are recommended for scientific fields, Reports (...)		
Lectures from online sites			Online References, Internet Sites		

Course Description Form

1. Name of the course					
Cultivation of lands					
2. Course Code					
LACU415					
3. Term/ Year					
First Semester 2025- 2026					
4. The date of preparation of this description					
2025–2026					
5. Available attendance forms					
Full time attendance					
6. Number of school hours (total/(number of units)total(					
5hours per week 2) theoretical hours 3+ operational hours (3- units					
7. Name of the course officer (if more than one name is mentioned)					
Ed. Riyadh Jabbar Mansour Eng. Salam Hamid Abdullah					
8. Course Objectives					
Identify the meaning of environmental concerns Identifying areas of spread and division of mudslides What are the risks of dehydration The benefits of escapes Physical and chemical properties of oils Deposits in mudslides and mineralization of deposits				Objectives of the Course	
9. Teaching and Learning Strategies					
Cooperative education Project Learning Self-learning Live Evaluation				Strategy	
10. Course Structure					
Assessme	Learning	Name of the unit or subject	Outputs learning	Hours	Week

nt Method	Method				
Daily Quizzes	Lecture with an explanation of a presentation	Definition of marshes and water swamps - The environmental		2	1
Daily Quizzes	Lecture with an explanation of a presentation	Geography of the marshes-climate of the marshes - geography of some		2	2
Daily Quizzes	Lecture with an explanation of a presentation	Division of the Central and Southern marshes - division of the marshes		2	3
Daily Quizzes	Lecture with an explanation of a presentation	Drying of the marshes and its impact importance of the Iraqi marshes		2	4
Daily Quizzes		First Month Examination			5
Daily Quizzes	Lecture with an explanation of a presentation	Benefits of the marshes - the geographical distribution of the		2	6
Daily Quizzes	Lecture with an explanation of a presentation	Evaluation of the physical properties of marsh soils in southern Iraq -		2	7
Daily Quizzes	Lecture with an explanation of a presentation	Some environmental and morphological studies of the marshes of southern Iraq Interface		2	8
Daily Quizzes	Lecture with an explanation of a presentation	Sediments in the marshes-mineral deposits of floors and types of clay		2	9
Daily Quizzes	Lecture with an	The effect of drying and burning on marsh soils. Physical and Chemical		2	10

	explanation of a presentation				
Daily Quizzes	Lecture with an explanation of a presentation	Marsh water quality - Marsh water quality before drying-water quality in the recovered marshes		2	11
Daily Quizzes	Lecture with an explanation of a presentation	Functional diversity - the relationship between environmental variables in water and biological communities		2	12
Daily Quizzes	Lecture with Annotator Presentation	Life functions of marshes-primary productivity of aquatic plants -		2	13
Daily Quizzes	Lecture with an explanation of a presentation	Food networks and chains in the-a wetlands road map for the restoration		2	14
Daily Quizzes		Second Month Examination			15

11. Evaluation of the decision

Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations
Editorial and reporting ... Etc.

12. Sources of Learning and Teaching

Lectures from online sites	Required decision books (methodology, if any)
There is no	Main references (sources)
There is no	Supporting books and references that are recommended in the journals Scientific, Reports (...)
There is no	Online References, Internet Sites

Course Description Form

1. Name of the course	
Practical land Cultivation	
2. Course Code	
LACU415	
3. Term/ Year	
First Semester 2025- 2026	
4. The date of preparation of this description	
2025–26	
5. Available attendance forms	
Full time attendance	
6. Number of school hours (total/(number of units)total(	
5 hours per week 2) theoretical hours 3+ operational hours (3.5-unit	
7. Name of the course officer (if more than one name is mentioned)	
Prof. Riyadh Jabbar Mansour Eng. Salam Hamid Abdullah	
8. Course Objectives	
To identify the vices of Iraq , their location and importance 1- Identification of climatic and peripheral conditions and their relationship in a form 2. Essentially by plant and animal organisms living in precipitation Recognize the impact of climatic conditions on the growth of different plants 3. Definition of the application for environmental pollution, dryness, damage and plan 4. Future risk aversion .	Objectives of the Course
9. Teaching and Learning Strategies	
The course includes (2) theoretical hours and (3) practical hours - the number of approved weekly hours distributed to 15 weeks .	Strategy
10. Course Structure	

Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Daily Quizzes	Lecture with an explanation of a presentation Introductory	Southern Iraq	Identify the soil of the marshes and how to cultivate it	2	1
Field visits	Lecture with an explanation of a presentation Introductory	Subsidies	Identify the environment of the marshes and ways to cultivate them	2	2
Applying projects	Lecture with an explanation of a presentation Introductory	Types and types of mudslinging And divided them	Determine types of marshes	2	3
Daily Quizzes	Lecture with an explanation of a presentation Introductory	Ahwar of Basra Governorate	Identify the marshes of Basra Governorate	2	4
Field visits	Lecture with an explanation of a presentation Introductory	Costs of martyrdom	Characteristic of Marshland Sediments	2	5
Applying projects	Lecture with an explanation of a presentation Introductory	Draining deterioration and of mudslides	Determine degradation in the marshland environment	2	6

		First Month Examination		2	7
Daily Quizzes	Lecture with an explanation of a presentation Introductory	Plant environment – and water plants distributed in the region	Learn about the aquatic environment	2	8
Field visits	Lecture with an explanation of a presentation Introductory	The division of plants in the aquatic environment , the morphological qualities of plants Submerged .	Division of plants in aquatic environments	2	9
Applying projects	Lecture with an explanation of a presentation Introductory	Anatomical Characteristics of Plants Submerged	Anatomical characterization of aquatic plants	2	10
Daily Quizzes	Lecture with an explanation of a presentation Introductory	Supernatant plants, their anatomical and morphological qualities	Definition and Anatomical Specifications of Floating Plants	2	11
Field visits	Lecture with an explanation of a presentation Introductory	Intermediate plants , biodiversity of aquatic plants in Mortgages	Biodiversity Challenge in Aquatic Environments	2	12
Applying projects	Lecture with an explanation of a presentation Introductory	Environmental pollution, introduction, definition, the impact of pollution on the water of the precipitation on objects Beard.	Identify environmental pollution and its causes	2	13
Field visits	Lecture with an explanation of a presentation Introductory	Complementary Biometric Evidence Mortgages	Distinguish between plant environments	2	14

		Second Month Examination		2	15
11. Evaluation of the decision					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations Editorial and reporting ... Etc.					
12. Sources of Learning and Teaching					
The book of the martyrdom statement, authored by Amir Al-Hasan Al-Imara			Required decision books (methodology, if any)		
			Main references (sources)		
Ḥawr al-‘Arāq , composed by ‘Abd ‘Alī Khafafīf and Ḥusayn al-Zayyādī			Supporting books and references that are recommended in the journals Scientific, Reports (...)		
Some research and articles on southern Iraq			Online References, Internet Sites		

Course Description Form

1. Course Name:
Molecular Genetics
2. Course Code
MOGE416
3. Trimester/ Year Trimester2 2025-2026
level 2/Stage 4
4. The date of preparation of this description
1-10-2025
5. Available attendance forms
Full time attendance

6. Number of school hours (total/(number of units)total(					
3 hours					
7. Name of the course officer (if more than one name is mentioned)					
Dr. Naseer Fahim Yasser					
8. Course Objectives:					
Identification of the student by heredity at the molecular level Objectives of Molecular Genetics and Achievements in Human Life in the Fields of Life What the genetic code is, what it is made of, and how it is copied. Its importance in Plant life What is amino acidosis and its relationship to genes and their role in building Protein.				Objectives of the Course	
9. Teaching and Learning Strategies					
Reliance on books and portfolios that are prepared for each lecture as a way to help increase their understanding Student Name Adding to the use of the teaching areas of the educational institutions that make use of the subject of the lecture.				Strategy	
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning Outcomes service.	Hours	Week
quiz	Explanation of the professorship and the video districts Educational	Introduction to molecular genetics and the importance of scientists who contribute to the development of	To be able on the understanding and understanding of the lesson and the answer to	2	1
quiz	Explanation of the professorship and the video districts Educational	The importance of molecular technology in various areas of life	To be able on the understanding and understanding of the lesson and the answer	2	2

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quiz	Explanation of the professorship and the video districts Educational	Plant and animal cell components and the difference between them	To be able on the understanding and understanding of the lesson and the answer to	2	3
quiz	Explanation of the professorship and the video districts Educational	RNA and DNA What is and what is the difference between them in terms of composition and function	To be able on the understanding and understanding of the lesson and the answer to	2	4
quiz	Explanation of the professorship and the video districts Educational	What is the gene and gene synthesis And what is the importance of	To be able on the understanding and understanding of the lesson and the answer to	2	5
Monthly Examination 1st	Explanation of the professorship and the video districts Educational	Reproduction of information Genetics	To be able on the understanding and understanding of the lesson and the answer to	2	6
quiz	Explanation of the professorship and the video districts Educational	DNA duplication	To be able on the understanding and understanding of the lesson and the answer to	2	7
quiz	Explanation of the professorship and the video	Aminoacidosis and Building Protein	To be able on the understanding and	2	8

	districts Educational		understandi ng of the lesson and the answer to		
quiz	Explanation of the professorship and the video districts Educational	The mechanics of the work of the gene	To be able on the understandi ng and understandi ng of the lesson and the answer to	2	9
quiz	Explanation of the professorship and the video districts Educational	Outside DNA Species Cellular	To be able on the understandi ng and understandi ng of the lesson and the answer to	2	10
quiz	Explanation of the professorship and the video districts Educational	Genetic mutations	To be able on the understandi ng and understandi ng of the lesson and the answer to	2	11
Monthly Examination Second	Explanation of the professorship and the video districts Educational	Transfer of genetic trait from one plant to another by Bacteria	To be able on the understandi ng and understandi ng of the lesson and the answer to	2	12
11. Evaluation of the decision					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily and oral examinations Monthly, editorial and reporting... Etc.					
12. Sources of Learning and Teaching					

There is no	Required decision books (methodology, if any)
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1. Name of the course	
Plant Breeding	
2. Course Code	
PLBR421	
3. Term/ Year	
Chapter Two (2025-2026)	
4. The date of preparation of this description	
1/ 2/ 2026	
5. Available attendance forms	
Full time attendance	
6. Number of school hours (total/(number of units)total(	
5 hours per week 2 (theoretical hours 3+ operational hours) / 3.5 units	
7. Name of the course officer (if more than one name is mentioned)	
Prof. Riyad Jabbar Mansour Eng. Salam Hamid Abdullah	
8. Course Objectives	
To know about the science of plant breeding and the sciences associated with To know about the methods of plant breeding and the objectives of pedagogy Study of methods of plant reproduction, male sterility and plant breeding Study of genetic and biological data and their relationship to plant growth	Objectives of the Course
9. Teaching and Learning Strategies	

Theoretical face-to-face lectures Field Applications Laboratory Applications Educational Projects Discussion of reports					Strategy
10. Course Structure					
Assessment Method	Learning Method	Unit Name or Subject:	Required Learning Outcomes	Hours	Week
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation	Definition of pedagogy Plants – Historical profile- Objectives of plant education – Foundations that	PLANTATION	2	1
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation	Methods of propagation in plants - Types of vaccination in plants - Factors that encourage	Enumerates methods of purification in plants	2	2
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation	Variations and their relationship to plant growth - types of differences – sterility and incompatibility - fluid	Distinguish between phenotypic and genetic variations	2	3
Daily Quizzes	Lecture with an explanation of a presentation	Male sterility- types – application interest for genetic symmetry – risk-multiplication	Determines male infertility and its type	2	4
Daily Quizzes Focus group discussions		First Month Examination			5
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation	Methods of plant breeding- duties of input circuits Genetic material- Import Steps –	Enumerates hybridization methods	2	6

Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation	Accommodation – Types – Election – Types- Pure Strain – Benefits of Pure Strain Election	Distinguish between adaptive plant capacity	2	7
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation	Comparison of in vitro and mixed vaccination outcomes – Comparison Gross Election and	Compares mix and self- pollinated crop varieties	2	8
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation	Comparing the steps of a method Recording the proportion and steps of the collection method – and comparison	Specifies the steps for registering items	2	9
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation	Interest on the method of inoculation Retrograde – Hybrid - Kind of hybrids	Enumerates the benefits of retrovaccination	2	10
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation	Structural class – Advantages	Distinguish the synthetic variety	2	11
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation	Plant breeding methods with vegetable reproduction	Raises vegetable plants	2	12
Daily Quizzes Focus group discussions					
Screen +blackboard	Lecture with an explanation of a presentation	Genetic mutations – their types – methods Events	Enumerates Genetic Vocabulary Types	2	13

		Second Month Examination			14
11. Evaluation of the decision					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily oral, monthly and written examinations And the reports... Etc.					
12. Sources of Learning and Teaching					
			Required decision books (methodology, if any)		
1- Heredity and breeding of Dr. Hamid Jaloub Ali's plants 2- Field Results Education Dr. Adan Al-Adhari 3- Raising and improving plants, Dr.Madhat Al-Saouki and others 4- Principle of Plant breeding (Author)			Main references (sources)		
There is no			Supporting books and references that are recommended for scientific fields, Reports (...)		
There is no			Online References, Internet Sites		

Course Description Form

1. Name of the course
Plant Breeding
2. Course Code
PLBR421
3. Term/ Year
Chapter Two (2025-2026)
4. The date of preparation of this description
1/2/2026
5. Available attendance forms

Full time attendance					
6. Number of school hours (total/(number of units)total(					
5 hours per week 2) theoretical hours 3+ operational hours (3.5-unit					
7. Name of the course officer (if more than one name is mentioned)					
Prof. Riyad Jabbar Mansour Eng. Salam Hamid Abdullah					
8. Course Objectives					
Introducing the pedagogy of plants and their importance Methods of plant breeding Difficulties faced by plant breeders when implementing educational programs Methods of modern breeding used to improve plant characteristics					Objectives of the Course
9. Teaching and Learning Strategies					
Theoretical face-to-face lectures Field Applications Laboratory Applications Educational Projects Discussion of reports					Strategy
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	Definition of plant education and improvement of the objectives of pedagogy Conducting a field visit to know On the vaccination of plants	PLANTATION	2	I
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	The syphilis system and its relationship to pedagogy and the calculation of the percentage of change Specific capacity	Distinguish between flower systems	2	2

Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	Review of the syphilis regimen for self-vaccinated and mixed crops	Distinguish between self-pollinating plants	2	3
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	Hybridisation	Interplant hybridization works	2	4
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	Conducting Taxes on Some Vaccinated Self-Products	Genetic taxation works	2	5
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	Conducting Taxes on Some Vaccination Cell Proceeds	Makes mixtures between plants	2	6
		First Month Examination		2	7
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	Field identification of crops Vaccination Vegetability	Identifies vegetative-breeding species	2	8

Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	Applied examples of hybrid power and internal education in intravascular and mixed-vaccination crops	Knows the power of the hybrid	2	9
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	Field visit to identify green and vegetable plants Polygamy	Diagnoses vegetative-breeding fodder plants	2	10
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	A field visit to identify and diagnose diseases and insects that infect the crops	Diagnose the difference between plants in insect infestation	2	11
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	Sufficient provisioning accounts for various types	Performs inheritance accounts of all kinds	2	12
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	Identify the reasons for a valuable difference Date	Recognizes differences in inheritance values	2	13
Daily Quizzes Focus group discussions	Lecture with an explanation of a presentation Introductory	Genetic Acquisition and Strength Account Hybrid	Calculates genetic attainment	2	14

	ory				
		Second Examination	Month	2	15
11. Evaluation of the decision					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations Editorial and reporting ... Etc.					
12. Sources of Learning and Teaching					
Raising and improving plants . The author of the doctor praising Al-Saouki and others			Required decision books (methodology, if any)		
Education and improvement of field crops . Hamid Jaloub Ali			Main references (sources)		
There is no			Supporting books and references that are recommended in the journals Scientific, Reports (...)		
Some research and special articles on pedagogy and improving plants			Online References, Internet Sites		

1. Name of the course	
Weed Control	
2. Course Code	
WECO423	
3. Term/ Year	
Level 2 /Fourth stage /2025-2026	
4. The date of preparation of this description	
1/2/2026	
5. Available attendance forms	
Full time attendance	
6. Number of school hours (total/(number of units)total(	
Five hours per week (three working hours + two theoretical hours) / 3 units	
7. Name of the course officer (if more than one name is mentioned)	
Prof. Dr. Nabil Rahim Lahmoud Eng. Moataz Abdul Kazem Shaker	
8. Course Objectives	
Determining the types of fields deployed in field crops, gardens, basestines, trocars and irrigation canals Choosing the best way to combat the spread of this propaganda Choosing the besttypes of pesticides used to eliminate fraud and identifying them Know the environmental effects of pesticides Distinguish between different control methods	Objectives of the Course
9. Teaching and Learning Strategies	
Cooperative education Education in projects Field Visits Self-learning	Strategy

10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning Outcomes service.	Hours	Week
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introductory	Dismissal of the history of the means of combating Fraudulence	Understands the stages of development of bush control	2	1
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introductory	Things to Consider When Fighting the Jungle	Identifies things to know before choosing a control method	2	2
Discussion of reports	Lecture with an explanation of a presentation Introductory	Anti-Jungle Methods	Distinguish between methods of combating the bush	2	3
Field visit	Lecture with an explanation of a presentation Introductory	Modern methods of combating the jungle	Knows modern methods of fighting the jungle	2	4
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introductory	Introduction to Chemical Control Methods	Identifies the development of pesticide use	2	5
Daily quizzes + group discussions	Lecture with an explanation of a presentation	Important definitions and terms in pesticide science	Recognizes some terminology in pesticide	2	6

	presentation Introductory		science		
Semi-Quarterly Test				2	7
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introductory	Methods of classifying and dividing bush pesticides	Distinguish between types of pesticides	2	8
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introductory	Environmental effects of chemical methods	Identifies the environmental effects of pesticides	2	9
Discussion of reports	Lecture with an explanation of a presentation Introductory	Critical Limits for Pesticide Use	Identifies critical time for pesticide application		10
Field visit	Lecture with an explanation of a presentation Introductory	Chemical Aggregates of Pesticides	Identifies aggregates of bush pesticides	2	11
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introductory	Inorganic Pesticides	Identifies inorganic types of pesticides and their effects	2	12
Semi-Quarterly Test	Lecture with an explanation of a presentation	Organic Pesticides	Distinguishes organic types of pesticides and their types	2	13

	n Introductory				
Daily quizzes + group discussions	Lecture with an explanation of a presentation Introductory	Residual pesticides in soil, water and plant	Identifies the effect of pesticides on soil, water and plant		
Semi-Quarterly Test					15

11. Evaluation of the decision	
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily and oral examinations Monthly, editorial and reporting... Etc.	
12. Sources of Learning and Teaching	
The book of publicity and ways of combating it/ Dr. Mohamed Hadhal Kazim Al-Badawi	Required decision books (methodology, if any)
Al-Daghool fi Al-Araq Book	Main references (sources)
A systematic book to combat propaganda	Supporting books and references that are recommended for scientific fields, Reports (...)
	Online References, Internet Sites

Study of

1. Name of the course
weed Control (Practical)
2. Course Code
WECO423
3. Term/ Year
Second semester (2025-2026)
4. The date of preparation of this description
2025–26

5. Available attendance forms					
My full-time attendance (laboratory and field)					
6. Number of school hours (total/(number of units)total(					
45 hours /units: 1 unit (for the practical part)					
7. Name of the course officer (if more than one name is mentioned)					
Prof.Dr. Nabil Rahim Lahmoud nraheem@uowasit.edu.iq M. Moataz Abdelkazem Shaker MautazAlbadri@uowasit.edu.iq					
8. Course Objectives					
- Introducing students to agricultural tools and equipment used in combating the bush. - Introducing students to the most important chemical pesticides used in combating jungles. - Providing students with the skills of calculating the economic feasibility of mechanical and manual control. - Training students on how to calculate doses and commercial materials for chemical pesticides. - Enabling students to conduct field experiments to combat the bush in different crops (corn, cotton, strategic crops) - Identify ways to combat water bush and problems with seed storage					
9. Teaching and Learning Strategies					
- Practical application in the fields of the college. - Educational laboratories to identify tools and pesticides. - Solve mathematical problems related to pesticide calculations and control percentages					
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning outcomes	Hours	Week
Daily Report	Field Explanation and Application	Identify the most important agricultural equipment used in combating the bush	The student can distinguish the machines used in mechanical control and their functional parts.	3	1
Share & Quick Quiz	Field application and problems	Conducting mechanical control and calculating the economic feasibility thereof	Acquiring the skill of manual extraction and calculating the economic cost of mechanical physical effort.	3	2

Laboratory report	Laboratory	The most important commonly used pesticides, when and how to add	Determine the types of commercial pesticides and know the optimal time to add them to the field.	3	3
- Homework.	gymnastics	Commercial pesticide material calculation	Mastering mathematical calculations to convert scientific recommendations into accurate commercial quantities.	3	4
Assessment of speaking skill	Field application	Control of broad-leaved bush with electoral pesticides	Distinguish between broad-leaved bush types and choose the appropriate electoral pesticide for them.	3	5
Assessment of speaking skill	Field application	Control of thin-leaved bush with electoral pesticides	Distinguish between high-leaved bush species and apply appropriate chemical control methods.	3	6
Grade rating	Written Test	First Monthly Exam	Measure the student's understanding of practical and computational concepts in the first six weeks.	1.5	7
storage	Field application	Control of the bush in maize fields	Knowing the types of bush competing for the corn crop and ways to control them sadly.	3	8
storage	Field application	Fighting the bush in cotton fields	Apply integrated control practices in cotton fields and observe crop response.	3	9
Discussion	Follow Field	Record observations and control ratio of pesticides (supplement for weeks 8 and 9)	Analyze control results in the field and calculate the percentage of pesticide efficiency used.	3	10
storage	Field application	Control of bush in major crop fields using non-elective pesticides	Ability to deal with bush in strategic crops in the Iraqi environment.	3	11
Share	Field application	Non-agricultural jungle control	Understand ways to control the bush in public places and uncultivated areas.	3	12
Grade rating	Written Test	Second Monthly Exam	Evaluate the applied and analytical skills acquired by the student in the second half of the	1.5	13

			subject.		
storage	Laboratory + Lecture	Useful and prohibited pesticides and methods of combating water bush	Identify the biology of the water bush and ways to combat it in irrigation and puncture channels.	3	14
General Revision	Laboratory	Seed storage problems	Understand the factors affecting the vitality of bush seeds during storage and how to limit their spread.	3	15

11. Evaluation of the decision

- Monthly exams (2): 30%
- Field and Laboratory Reports: 10%
- Participation and daily tests (Quizzes): 10%
- Final Exam (Practical): 50%

12. Sources of Learning and Teaching

• Jungle Science, Dr. Baqer Al-Jubouri, Jungle in Iraq. • The jungle and ways to combat it . Dr. Baqer Khalaf Al-Jubouri and Fayek Tawfiq Al-Jalabi.	Textbooks (if any)
• Weed Science: Principles and Practices. Thomas J. Monaco, David C. Bridges, Alan R. Tolls • Fundamentals of Weed Science. Robert L. Zimdahl	Supporting References
InternationalHerbicide-ResistantWeed Database. Herbicide Resistance Action Committee - HRAC. Weed Science Society of America - WSSA.	Electronic References

Study of

1. Name of the course
Plant Growth Regulators
2. Course Code
PLGR422
3. Term/ Year

Second Semester 2025 - 2025					
4. The date of preparation of this description					
1/2/2026					
5. Available attendance forms					
In-Person					
6. Number of school hours (total/(number of units)total(					
5 hours (2 theoretical and 3 practical) Number of units 3					
7. Name of the course officer (if more than one name is mentioned)					
Prof. Dr. Naseer Fahim Yasser nafahim@uowasit.edu.iq Eng. Zahra Hamid Ruwaidi Eng. Saleh Hadi Faraj					
8. Course Objectives					
- Teaching students the applications of plant growth regulators in the field of field crops. - Teaching students the role of plant growth organizations in increasing the production of the crop. - Teaching students the physiological effects of plant growth organizations. - Teach students how to treat plants with plant growth regulators.					
9. Teaching and Learning Strategies					
ب- Skills : Training students to obtain the practical skills necessary to work in laboratories. Training students to obtain practical skills in the use of modern laboratory techniques. Students acquire the laboratory skills necessary for plant growth regulators technology to treat plants. Training students to obtain the skills required by the work for ways to add plant growth organizations.			ا- Knowledge and understanding: Enabling students to know and understand the basics of plant hormones and growth regulators. Enabling students to know ways to control growth through treatment with plant growth organizations. Knowledge of modern methods used in plant growth organizations. Understand the plant's hormonal needs and improve growth hormonally.		
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning Outputs	Hours	Week
Daily Report	Field Explanation and	Types of Plant Growth Hormones	The student can distinguish between types of plant hormones.	2	1

	Application				
Share & Quick Quiz	Field application and problems	Growth Hormones and Leg Elongation	Gain recognition of the effect of plant hormones on leg growth and elongation	2	2
Laboratory report	Laboratory	Growth Hormones and Apical Sovereignty	Knowing their influence on the apical sovereignty of the plant	2	3
- Homework.	gymnastics	Growth Hormones	Its role in the formation of flowers and determining the gender of the flower.	2	4
Assessment of speaking skill	Field application	Growth Hormones and Photosynthesis	Knowing its role in regulating photosynthesis.	2	5
Assessment of speaking skill	Field application	Growth hormones and the transfer and distribution of nutrients in the plant	Explanation of the mechanism of action of growth hormones in the transmission and distribution of foodstuffs.	2	6
Grade rating	Written Test	First Monthly Exam	Measure the student's understanding of practical and computational concepts in the first six weeks.	2	7
storage	Field application	Effects of Growth Regulators at Roots	Control of absorption and transport of water and nutrients	2	8
storage	Field application	Effects of Growth Regulators on Grain Crops	A statement of the increase in the quotient associated with the regulation and balance of plant hormones.	2	9
Discussion	Follow Field	Effects of Growth Regulators on Seed Pulse Crops	Explain their role in the growth and development of legume plants	2	10
storage	Field application	Effects of Growth Regulators on Fibre Crops	Explain their role in the growth and development of fiber crops	2	11
Share	Field application	Effects of Growth Regulators on Oil Crops	Explain their role in the growth and development of oil plants	2	12
storage	Laboratory + Lecture	Effects of Growth Regulators on Sugary Crops	Explanation of its role in seed germination and dormancy	2	13
General Revision	Laboratory	The Future and Uses of Growth Organisers	Identify the biology of plant hormones and growth regulators and	2	14

			their implications for the future		
Grade rating	Written Test	Second Monthly Exam	Assessment of the applied and analytical skills acquired by the student in the second half of the course	2	15
11. Evaluation of the decision					
Daily and monthly tests through questions on the subject matter. Grades on student participation in research and scientific reports. Students' class and home activities. Familiarize yourself with modern technologies relevant to plant growth organizations. Expanding the student's scientific and practical perceptions.					
12. Sources of Learning and Teaching					
The book of plant growth organizations. Plant Physiology Flower and growth regulators.			المجلات (الكتب والمراجع الساندة التي يوصى بها ...العلمية، التقارير):		
-Hans Mohr & Peter Schopfer. Plant Physiology. Springer-Verlag, Latest Edition. William G. Hopkins & Norman P. A. Hüner. Introduction to Plant Physiology. John Wiley & Sons, Latest Edition.			Supporting books and references that are recommended in the journals Scientific, Reports (...		
.American Society of Plant Biologists (ASPB) - Plant Physiology (Oxford Academic) Food and Agriculture Organization of the United Nations (FAO)			Online References, Internet Sites		

Course Description Form

1. Course Name:	
Field crops management	
2. Course Code	
FICM414	
3. Semester: Autumn/ Year : (2025-2026)	
Chapter One/Stage Four	
4. Date of preparation of this description:	
1/10/ 2025	
5. Available attendance forms:	
Full time.	
.63.5 Number of school hours (total)	
2 theoretical hours + 3 working hours per week/ number of units (total3.5-5)	
7. Name of the course officer (if more than one name is mentioned)	
Dr. Hussein Ibrahim Tarish Eng. Wamid Majeed Ali	
Providing the student with practical and theoretical information on the field management. 8 Objectives of the course -	
Teaching students basic education to specialize in field fields Teaching the student for future work in ministries and institutions with Relevance to agricultural science Preparing two scientific and academic researchers in the field of field crop management	Objectives of the Course
9. Teaching and Learning Strategies	
Appropriate learning strategies for this course in brief: 1. Field Monitoring: Accompanying the crop in the field through its critical growth stages (germination, branching, elongation, expulsion, and maturation) to link the external appearance to service and irrigation requirements. 2. Investigation to estimate the components of the yield (Yield Components Analysis): Practically training students to calculate the prediction of productivity before harvest by random sampling and calculating (the number of spike/square meter, the number of grains/spike, and the weight of 1000 grains). 3. Project-Based Learning: Assigning students (in groups) to	Strategy

manage a complete production plan for a particular grain crop, from variety selection and planting date to harvesting and marketing. • 4. Quality Lab Testing: Conducting laboratory experiments to determine the suitability of grains for processing, such as protein ratio tests, gluten testing in wheat (for baking bread), or milling clarification in rice.					
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week
Tests Daily Focus group discussions	Lecturer	Concept of the product – Concept Crop Management	Field crops management	2	1
Tests Daily Focus group discussions	Presentation Lectures	Pre-cultivation Soil Service - Tillage - Concept -Benefits – Good Tillage Conditions – Tillage Types -Types	Applies crop service	2	2
Tests Daily Focus group discussions	Presentation Lectures	Smoothing – the benefit of smoothing –deep Smoothing - Smoothing Machines – Settlement – Benefits of Settlement – Its conditions - settlement mechanisms -	enumerates the benefits of tillage	2	3
Tests Daily Focus group discussions	Presentation Lectures	Crop Service – Replanting Dates - Thermal Units (Group GDD) And its relationship to the timing of agriculture -	Planting dates	2	4
		Examination -1-		2	5
	Presentation Lectures	Soil husbandry - conditions for cultivation of valid crops	Agricultural soils	2	6

Tests Daily Focus group discussions	Lecturer	The amount of seed - vegetative density - the role of vegetative density in the display of light and increase	Determines the appropriate quantities of seeds	2	7
Tests Daily Focus group discussions	Presentation Lectures	Methods of Agriculture –Amaq	Planting Methods	2	8
Tests Daily Focus group discussions	Presentation Lectures	Examination -2-		2	9
Tests Daily Focus group discussions	Presentation Lectures	Fertilization - types of fertilizers – the role of fertilizers in increasing growth Crop yield - soil improvers -fertilizer	Distinguishes the role of fertilizer	2	10
Tests Daily Focus group discussions	Lecturer	Al Rai – Importance of Water for Plants – Number of rallies for the product – efficient consumption of water	Knows how to irrigate	2	11
Tests Daily Focus group discussions	Presentation Lectures	Fighting adulthood - most importantly Pesticides and recommended to combat insects and diseases	Combats jungles with pesticides	2	12
Tests Daily Focus group discussions	Presentation Lectures	Examination -3-		2	13
Tests Daily Focus group discussions	Presentation Lectures	Maturation and Harvesting - Maturation Fully maturing physiologist - maturation markers for yields	Distinguish between mature plants	2	14

	Presentation Lectures	Storage of the crop - types Warehouses and storage, seed and grain stores and their specifications and storage conditions, including heat, moisture, preventive pesticides, drying methods	Specifies seed specifications for storage	2	15
11. Evaluation of the decision					
Distribution of the grade of 30 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations Editorial and reporting ... Etc.					
12. Sources of Learning and Teaching					
There is no			Required decision books (methodology, if any)		
Scientific Foundations for Managing, Producing and Improving Outcomes Field . Hussain Al Maeni and Mohammed Owaid Ghair Al Abedi . Faculty of Agriculture – University . Al-Anbar, 2018 2- Plant Nutrition Guide . Youssef Mohamed Abu Dahi and UNTRANSLATED_CONTENT_START UNTRANSLATED_CONTENT_END Yunus . Faculty of Agriculture – University of Baghdad, 1988... 3- Production and improvement of field crops (Part I) Abdulhamid Ahmed . University , University of Baghdad - Faculty Agriculture , 1993			Main references (sources)		
There is no			Supporting books and references that are recommended for scientific fields, Reports (...)		
There is no			Online References, Internet Sites		

Course Description Form

1. Course Name:						
1 field crop management practical						
2. Course Code						
FICM414						
3. Semester: Autumn/ Year : (2025-2026						
Chapter One/Stage Four						
4. The date of preparation of this description						
2025-2026						
5. Available attendance forms:						
Full time attendance						
6. Number of school hours(total)/ number of units (total)						
2 hours theoretical + 3 hours weekly						
7. Name of the course officer (if more than one name is mentioned)						
Eng. Wamid Majeed Ali						
Providing the student with practical and theoretical information on the field management. 8						
Objectives of the course -						
Teaching students basic education to specialize Field crops Teaching students for future work in ministries					Objectives of the Course	
9. Teaching and Learning Strategies						
-1 Group Discussions 2. Field visits Learn about projects					Strategy	
10. Course Structure						
Assessm ent	Learning Method	Name of the unit or subject	Required Learning Outcomes	Hours	Week	

Method					
Tests Daily and Monthly	Lecturer Process Episodes	Tilling procedures, observing their specifications and controlling them after identifying their defects in terms of soil moisture and size Derivative Blocks and Spreads	Field crops management	3	1
Tests Daily and Monthly	Vomiting Lectures Operation Episodes	Field division and settlement For cultivation in the next week	Correctly divides fields	3	2
Tests Daily and Monthly	Lecturer Process Episodes	Cultivation of one or more crops at the same time and plant density by means of scattering, lines and crops, and taking notes on growth and yields	growing crops?	3	3
Tests Daily and Monthly	Lecturer Process Episodes	Multi-date crop cultivation and data coding to know Tathir Quarterly Dates	Field data is recorded	3	4
		Examination -1-		3	5
Tests Daily and Monthly	Lecturer Process Episodes	Cultivation of several doses to be compared with NPK from Nitrogen Fertilization	Cultivation of crops of different densities	3	6
Tests Daily and Monthly	Vomiting Lectures Process Episodes	Agriculture of irrigation crops after Various 5) and 10 days (or every week and two weeks and note taking about growth To know the role of water	Determines the number of irrigation per crop	3	7
Tests Daily and Monthly	Vomiting Lectures Process Episodes	double-transacted agriculture One of them removes the tampering manually and the other without removing it and if it is using a pesticide for comparison	Determines the impact of the bush on the crop	3	8

		Recording data			
Tests Daily and Monthly	Vomiting Lectures Process Episodes	The value of a group of orders By recording the incidence of insects and diseases and trying to diagnose them for each cultivated crop	Determines infection rates of insects and diseases	3	9
Tests Daily and Monthly	Vomiting Lectures Operation Episodes	The value of a group of orders Following the maturity markers on the product and conducting moisture tests on	Identifies signs of crop maturity	3	10
Tests Daily and Monthly	Lecturer Operation	Submission of a set of the application in full with the reports that may be numbered and discussed at the end of	Build a results report	3	11
		Second Month Examination		3	12
11. Evaluation of the decision					
Distribution of the grade of 30 according to the tasks assigned to the student, such as daily preparation and daily, oral and monthly examinations Editorial and reporting ... Etc.					
12. Sources of Learning and Teaching					
There is no			Required decision books (methodology, if any)		
The scientific foundations for the management, production and improvement of field outcomes. Hussain Al Maeeni and Mohammed Owaid Ghair Al Abedi . Faculty of Agriculture – University . Al-Anbar, 2018 2- Plant nutrition manual . Youssef Mohamed Abu Dahi and Yunus . Faculty of Agriculture – University of Baghdad, 1988... 3- Production and improvement of field			Main references (sources)		

crops (Part I) Abd Hamid Ahmed . University of Baghdad - Faculty of Agriculture , 1993	
There is no	Supporting books and references that are recommended for scientific fields, Reports (...)
There is no	Online References, Internet Sites

Course Description Form

1. Course Name:
Environmental stress
2. Course Code
ECST425
3. Term/ Year
Chapter 2/Stage 4 2025-2026
4. The date of preparation of this description
3 August 2025
5. Available attendance forms
Full time attendance
6. Number of school hours (total) number of units (total) 3 hours (two units)
Total number of hours 5 (2 theoretical 3+ practical) Number of units 3
7. Name of the course officer (if more than one name is mentioned)
Dr. Ahmed Shaker Mohsen
Eng. Hadeel Hamza Ali
Eng. Ali Bashir Hadi
8. Course Objectives:

Definition of the student in biology and biology to which plants are exposed In the field The Nature of the Effects of Generations on Growth and Production Responsiveness of plants to stress at the physiological and superficial level Explanation and clarification of the meaning of tolerant, tolerant and resistant plants extremophile plants Concept of Extreme Plants				Objectives of the Course	
9. Teaching and Learning Strategies					
Reliance on the book, research and powerpacks that are prepared for each lecture in order to help increase the student's understanding. Laboratory application of the Jurisprudence presented by the Plants with the Preparation of a Report for each trial.				Strategy	
10. Course Structure					
Assessment Method	Learning Method	Name of the unit or subject	Learning Outcomes service.	Hours	Week
Weekly cob + trial report	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	A general introduction to the vital stresses that include: global temperature intensity, endogenous temperature intensity, stress	To be able Based on the understanding and understanding of the lesson and the answer	2	1
Weekly Cooze	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	Extreme heat, tolerance to high heat, the nature of the damage caused by high heat, and liquid	To be able Based on the understanding and understanding of the lesson and the answer	2	2
Weekly Cooze	Explanation of the theoretical study with the practical application of the experiment of	Physiological basis To withstand high temperature, calcium and related to the intensity of heat,	To be able Based on the understanding and understand	2	3

	agricultural stress	the effect of heat on	ding of the lesson and the answer		
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Weekly Cooze	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	Low temperature stress, acclimatization to cold, tension Water, Concept, Levels, Determination Methods	To be able Based on the understanding and understanding of the lesson and the answer	2	4
Weekly Cooze	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	Methods of water stress in plants, classification of plants according to their resistance to dryness, method of acclimatization	To be able Based on the understanding and understanding of the lesson and the answer	2	5
First Monthly Examination	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	Effects of water stress and drought, causes and negative effects on plants at the stage of the seedling plants	To be able Based on the understanding and understanding of the lesson and the answer	2	6
Weekly Cooze	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	Effect of stress on nitrogen fixation, water stress and protein formation and amino acidosis	To be able Based on the understanding and understanding of the lesson and the answer	2	7
Weekly Cooze	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	Oxidative stress, salts and their impact on plants (provided)	To be able Based on the understanding and understanding of the lesson and the answer	2	8

Weekly Cooze	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	Sources of salts, measurements of salts, high salinity damages, salt-loving plants and their aspects	To be able Based on the understanding and understanding of the lesson and the answer	2	9
Weekly Cooze	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	Definition by salt-loving plants, physiological basis for salt tolerance in plants	To be able Based on the understanding and understanding of the lesson and the answer	2	10
Weekly Cooze	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	Salt effects, resistance to saline plants, roads Salinity Resistance	To be able Based on the understanding and understanding of the lesson and the answer	2	11
Second Monthly Examination	Explanation of the theoretical professor with Practical application of the agricultural stress experiment	Variation of plants in Its resistance to salinity, stress Saline and the role of protein, bearing salinity in the crops	To be able Based on the understanding and understanding of the lesson and the answer	2	12
Second Monthly Examination	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	Salinity tolerance in feed crops, sodium and salt stress, calcium and stress Saline	To be able Based on the understanding and understanding of the lesson and the answer	2	13
Second Monthly Examination	Explanation of the theoretical study with the practical	The relationship of Proline and Hamad Alabsik Asad with water	To be able Based on the understand	2	14

n	application of the experiment of agricultural stress	stress And salty.	ding and understanding of the lesson and the answer		
Second Monthly Examination	Explanation of the theoretical study with the practical application of the experiment of agricultural stress	The stress of pollution by heavy elements, the reasons for the negative effects (toxicity) on plants, a mechanism that tolerates	To be able Based on the understanding and understanding of the lesson and the answer	2	15
11. Evaluation of the decision					
Distribution of the grade of 100 according to the tasks assigned to the student, such as daily preparation and daily and oral examinations Monthly, editorial and reporting... Etc.					
12. Sources of Learning and Teaching					
			Required decision books (methodology, if any)		
1-Principles of Molecular Inheritance, 2013 by Dr. Mohammed Baqer Sahib And Dr.Ali Hamoud Al-Saeed and Haider Kamel Yadan-2 Biotechnology Foundations, .2014 Doctor Ali Ibrahim ‘Abdah and Dr. Ahmad ‘Abd al-Fatāḥ Ḥamd 1- Genetics, P.S. Verma, 200. S.CHAND and Gulfcentral Company Ltd. 7361 RAM NAGER, newDELHI-110 056 2- Molecular life of the plants, 2013. Russell Jones, Howard Thomas, Susan Waaland			Main references (sources)		
Books above			Supporting books and references that are recommended (scientific journals, reports)...		

http://lifeofplant.blogspot.com/2011/05/chloroplast-dna.html https://www.youtube.com/watch?v=wwTv8TqWC48 https://www.youtube.com/watch?v=kmrUzDYAmEI UNTRANSLATED CONTENT START https://www.youtube.com/watch?v=kmrUzDYAmEI TRANSLATED CONTENT END 	Online References, Internet Sites
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1-Principles of Molecular Inheritance, 2013 by Dr. Mohammed Baqer Sahib And Dr.Ali Hamoud Al-Saeed and Haider Kamel Yadan-2 Biotechnology Foundations, .2014 Doctor Ali Ibrahim ‘Abdah and Dr. Ahmad ‘Abd al-Fatah Hamd 1- Genetics, P.S. Verma, 200. S.CHAND and Gulfcentral Company Ltd. 7361 RAM NAGER, newDELHI-110 056 2- Molecular life of the plants, 2013. Russell Jones, Howard Thomas, Susan Waaland	Main references (sources)
Books above	Supporting books and references that are recommended (scientific journals, reports)...
http://lifeofplant.blogspot.com/2011/05/chloroplast-dna.html https://www.youtube.com/watch?v=wwTv8TqWC48 https://www.youtube.com/watch?v=kmrUzDYAmEI	Online References, Internet Sites