Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Academic Program Description Form

University Name: Northern Technical University

Faculty/Institute: Agricultural Technical College/Mosul

Scientific Department: Animal Production Technologies

Academic or Professional Program Name: Bachelor's

Final Certificate Name: Technical Bachelor's in Animal Production

Academic System: Courses

Description Preparation Date: 15/9/2025

File Completion Date: 15/9/2025

Signature:

Head of Department Name:

Pr.Dr. Donia Abdulrazzaq Abdullah

Date:15/9/2025

Signature:

Scientific Associate Name:

Dr. Hesham Hashem Mohammed

Date:15/9/2025

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Haneen Mowfak Ahmed

Date: 15/9/2025

Signature:

Approval of the Dean

تم المسح الضوئي بـ CamScanner

1. Program Vision

The Animal Production Technologies Department, with its advanced scientific staff, laboratories, fields, farms, and projects, strives to be a scientific center that works to develop the reality of livestock in Iraq by supplying the labor market with agricultural engineering and technical staff.

2. Program Mission

The Animal Production Technology Department is committed to graduating agricultural engineering technicians with bachelor's and master's degrees who are ready to enter the job market with confidence, as they possess the skills and abilities to work in and manage animal production projects.

3. Program Objectives

The Animal Production Techniques Department aims to develop curricula and provide model laboratories, animal farms, fish hatcheries, and fish farms to graduate qualified cadres to work in:

- **Poultry farm and hatchery management.**
- **Sheep and calf fattening project management.**
- **Managing dairy production and manufacturing projects.**
- **Managing hatcheries and fish farms.**
- **Training and developing the skills of workers in the animal production sector.**
- **Developing animal nutrition and feed alternatives.**
- **Providing scientific and practical advice to breeders and those interested in the animal production sector.**

4. Program Accreditation

None

5. Other external influences

The presence of a sponsor that contributes to:

1- Linking the program to the job market or community
2- Providing financial, logistical, or training support
3- Facilitating employment and practical training

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	10	20	14.5%	Essential
College Requirements	12	24	17.5%	Essential and non-essential
Department Requirements	40	94	68%	Essential and non-essential
Summer Training	2	Mustafi		Essential
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
First	NTU 100	Democracy and Human Rights	2	0
	NTU 101	English Language	2	0
	NTU 102	Computer	1	1
	NTU 103	Arabic Language	2	0
	TAMO 101	Mathematics	1	0
	TAMO 102	Engineering Drawing	0	3
	TAMO 103	Plane Surveying	1	3
	TAMO 104	General Chemistry	1	3
	ANP 101	Animal Ecology and behavio	2	3
	ANP 102	Animal Science	2	3
	ANP 103	Poultry production Techniques	2	3
	ANP 104	Feed crops and Pastures	1	3
	ANP 105	Sheep and goat Production Techniques	2	3
	ANP 151	Principal of Animal production	1	3
	ANP 152	Laboratories Techniques	1	3
Second	NTU 200	English Language	2	0
	NTU 201	Computer	1	1
	NTU 202	Arabic language	2	0
	NTU 203	Baath regime crimes	2	0
	NTU 204	Professional Ethics	2	0
	TAMO 201	Organic Chemistry	2	3
	TAMO 202	Agricultural Statistic	1	2
	TAMO 252	Food industries	1	3
	ANP 201	Ruminants Physiology	2	3
	ANP 202	Reproductive physiology	2	3
	ANP 203	Fish Biology and Ecology	2	3
	ANP 204	Dairy Production Techniques	1	3
	ANP 205	Buffalo and Camel production	1	3
	ANP 207	Food and roughage	1	3

		analysis		
	ANP 208	Dairy milk production	1	3
	ANP 209	General Genetic	1	3
	ANP 252	Technology and marketing of Meat Products	1	3
	ANP 255	Fingerlings Production	2	3
Third	TAMO 301	Computer Applications(3)	1	2
	TAMO 302	Biochemistry	2	3
	ANP 301	Animal Nutrition	2	3
	ANP 302	Veterinary Pharmacology and toxicology	1	3
	ANP 303	Fish Diseases	1	3
	ANP 304	Fish farming and production	2	3
	ANP 305	Poultry physiology	2	3
	ANP 306	Animal Diseases	1	3
	ANP 307	Poultry Nutrition	2	3
	ANP 308	Meat production Techniques	1	3
	ANP 309	Animal breeding and improvement	2	3
	ANP 351	Animal production Machinery	1	3
	ANP 352	Marketing of animal production	1	3
	ANP 355	Animal Histology	1	3
Fourth	NTU 410	Methodology of Scientific Research	2	0
	TAMO 401	Experimental Design and Analysis	1	3
	TAMO 402	Computer Applications (4)	1	3
	TAMO 452	Agricultura Marketing	2	0
	ANP 401	Poultry Breeding and improvement	1	3
	ANP 402	Embryo Transfer and artificial insemination	1	3
	ANP 403	Meat cattle production	1	3
	ANP 405	Farm Management and establish techniques	1	3
	ANP 406	Genital diseases and obstetrics	1	3
	ANP 407	Forage Manufacturing	1	3
	ANP 408	Ruminants Digestive Physiology	2	3
	ANP 409	Poultry Diseases	1	3
	ANP 451	Wild animals and decorations	1	3
	ANP 452	Eggs and sperm Technology	1	3
	ANP 454	Zoonotic Diseases	1	3

8. Expected learning outcomes of the program

Knowledge
A1- The student should be able to understand some of the sciences related to animal production, such as (area, engineering drawing, chemistry, mathematics, statistics, marketing, experimental design and analysis, statistics, and genetics). **A2- The student understands the methods used in raising farm animals and their reproduction methods.** **A3- The student understands the methods used in feeding farm animals.** **A4- The student is able to analyze and interpret some diseases that affect farm animals.** **A5- The student is familiar with human rights, democracy, and the crimes of the Ba'ath Party.**
Skills
B1 – Ability to use a computer. **B2 – Ability to diagnose and treat certain diseases affecting farm animals.** **B3 – Ability to communicate and speak Arabic and English and write reports in both languages.** **B4 – Ability to prepare feed mixtures according to the type of animal.**
Ethics
A1- Acquire the professional ethics that they learn. **A2- Learn about scientific research ethics.** **A3- Acquire the skill of raising farm animals.**

9. Teaching and Learning Strategies

Theoretical lectures, practical application in animal fields, scientific trips, summer training, educational videos, presentations, discussions, student debates, feedback

10. Evaluation methods

Final exams, midterm exams, daily exams, oral exams, reports, seminars

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor	Food Science and Biotechnology	Dairy Science		Scientific research and computer skills	1	0
Assistant Professor	Veterinary medicine and surgery	Veterinary biochemistry		Scientific research and computer skills	1	0
Assistant Professor	Veterinary medicine and surgery	Veterinary microscopy		Scientific research and computer skills	0	1
Assistant Professor	Animal Production	Animal Philosophy		Scientific research and computer skills	1	0
Assistant Professor	Veterinary medicine and surgery	Veterinary parasites		Scientific research and computer skills	1	0
Lecturer	Food Science and Biotechnology	Food Science and Biotechnology		Scientific research and computer skills	1	0
Lecturer	Veterinary medicine and surgery	Veterinary diagnoses		Scientific research and computer skills	1	0
Lecturer	General Organic Chemistry	Heterocyclic Chemistry		Computer skills	1	0
Assistant Lecturer	Veterinary medicine and surgery	Veterinary diseases		Scientific research and computer skills	1	0
Assistant Professor	Animal production	Animal production		Computer skills	8	1
Assistant Lecturer	Agricultural Economics	Agricultural Economics		Computer skills	1	0
Assistant Lecturer	Agricultural Machinery & Machinery	Agricultural Machinery & Machinery		Computer skills	1	0

Professional Development

Mentoring new faculty members

- Training courses in the field of specialization **- Courses on teaching and learning** **- Courses on how to publish scientific research**
Professional development of faculty members
- Training courses in the field of specialization **- Development of scientific publishing skills**

12. Acceptance Criterion

Criteria adopted in the central admission process of the Ministry of Higher Education and Scientific Research

13. The most important sources of information about the program

- **Northern Technical University website.**
- **Agricultural Technical College website.**
- **Animal Production Technology Department website.**
- **Scientific research published by department members.**
- **Books on animal production.**
- **Educational videos from YouTube.**

14. Program Development Plan

- **Work on updating curricula to keep pace with the job market**
- **Work on developing educational laboratories in the department**
- **Work on developing educational fields in the department**

Program Skills Outline																
				Required program Learning outcomes												
Level	Course Code	Course Name	Basic or optional	Knowledge					Skills				Ethics			
				A1	A2	A3	A4	A5	B1	B2	B3	B4	C1	C2	C3	
First	NTU 100	Democracy and Human Rights	Basic					✔								
	NTU 101	English Language	Basic								✔					
	NTU 102	Computer	Basic						✔		✔					
	NTU 103	Arabic Language	Basic								✔					
	TAMO 101	Mathematics	Basic	✔												
	TAMO 102	Engineering Drawing	Basic	✔												
	TAMO 103	Plane Surveying	Basic	✔												
	TAMO 104	General Chemistry	Basic	✔												
	ANP 101	Animal Ecology and behavio	Basic		✔	✔							✔		✔	
	ANP 102	Animal Science	Basic		✔											
	ANP 103	Poultry production Techniques	Basic		✔											
	ANP 104	Feed crops and Pastures	Basic	✔		✔						✔				
	ANP 105	Sheep and goat Production Techniques	Basic		✔	✔										
	ANP 151	Principal of Animal production	Optional		✔											
	ANP 152	Laboratories Techniques	Optional	✔			✔			✔						
Second	NTU 200	English Language	Basic								✔					
	NTU 201	Computer	Basic						✔							
	NTU 202	Arabic language	Basic								✔					
	NTU 203	Baath regime crimes	Basic					✔								

	NTU 204	Professional Ethics	Basic										✔		
	TAMO 201	Organic Chemistry	Basic	✔											
	TAMO 202	Agricultural Statistic	Basic	✔											
	TAMO 252	Food industries	Basic	✔											
	ANP 201	Ruminants Physiology	Basic			✔						✔			
	ANP 202	Reproductive physiology	Basic		✔										
	ANP 203	Fish Biology and Ecology	Basic		✔	✔							✔		✔
	ANP 204	Dairy Production Techniques	Basic	✔											
	ANP 205	Buffalo and Camel production	Basic		✔	✔									
	ANP 207	Food and roughage analysis	Basic			✔						✔			
	ANP 208	Dairy milk production	Basic		✔										
	ANP 209	General Genetic	Basic	✔	✔		✔			✔					
	ANP 252	Technology and marketing of Meat Products	Optional	✔											
	ANP 255	Fingerlings Production	Optional		✔	✔									✔
Third	TAMO 301	Computer Applications(3)	Basic						✔						
	TAMO 302	Biochemistry	Basic	✔						✔					
	ANP 301	Animal Nutrition	Basic			✔						✔			
	ANP 302	Veterinary Pharmacology and toxicology	Basic				✔			✔					
	ANP 303	Fish Diseases	Basic				✔			✔					
	ANP 304	Fish farming and production	Basic		✔	✔				✔			✔		✔
	ANP 305	Poultry physiology	Basic				✔			✔					
	ANP 306	Animal Diseases	Basic				✔			✔					

	ANP 307	Poultry Nutrition	Basic			✔						✔			
	ANP 308	Meat production Techniques	Basic		✔	✔									
	ANP 309	Animal breeding and improvement	Basic		✔								✔		✔
	ANP 351	Animal production Machinery	Optional	✔											
	ANP 352	Marketing of animal production	Optional	✔											
	ANP 355	Animal Histology	Optional	✔	✔					✔					
Fourth	NTU 410	Methodology of Scientific Research	Basic								✔			✔	
	TAMO 401	Experimental Design and Analysis	Basic	✔					✔						
	TAMO 402	Computer Applications (4)	Basic						✔						
	TAMO 452	Agricultura Marketing	Basic	✔											
	ANP 401	Poultry Breeding and improvement	Basic		✔								✔		✔
	ANP 402	Embryo Transfer and artificial insemination	Basic		✔	✔									
	ANP 403	Meat cattle production	Basic		✔										✔
	ANP 405	Farm Management and establish techniques	Basic		✔	✔							✔		
	ANP 406	Genital diseases and obstetrics	Basic		✔		✔			✔					
	ANP 407	Forage Manufacturing	Basic			✔						✔			
	ANP 408	Ruminants Digestive Physiology	Basic			✔									
	ANP 409	Poultry Diseases	Basic				✔			✔					
	ANP 451	Wild animals and decorations	Optional		✔										✔
	ANP 452	Eggs and sperm Technology	Optional		✔										
	ANP 454	Zoonotic Diseases	Optional				✔			✔					

Course Description Form

1. Course name:	
Democracy and human rights	
2. Course code:	
NTU 100	
3. Level/Academic Year:	
First	
4. Description preparation date:	
17/7/2025	
5. Available attendance forms:	
Paper form including name, date of attendance and signature	
6. Number of credit hours (total) / Number of units (total):	
30 hours/2 units	
7. Name of course supervisor (mention all names if there are multiple supervisors):	
Name: Dr. Abdul Majeed Mahmoud Hamoudi amyl: **Abdulmagid2020@ntu.edu.iq**	
8. Course objectives:	
1Introducing the student to the most important laws related to human rights. 2Introducing the student to the most important Iraqi constitutions and their relationship to human rights. 3Teaching the student to respect the freedom of others in dealing with him, taking into account the cultural differences in the Iraqi environment.	**Course objectives:**
9. Teaching and learning strategies:	

• Dialogue-based learningAnd discussion. • Brainstorming. • learningCooperative and collective. • Practical training. • LearningMSelf.	Strategy:

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	watches	week
Oral and written tests	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Human rights, definition, and objectives.	For the student to understand First: Knowledge and understanding Second: Intellectual skills Third: Practical skills Fourth: Values and trends	2	1
Oral and written tests	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	The roots of human rights and their development throughout human history. Human rights in ancient times.	The student must be able to:: 1.**Defines the roots of human rights** 2.**It reviews the most important historical stations.**Which contributed to the development of the concept of human rights throughout the ages. 3.**Explains how the concepts of justice, freedom, and equality were expressed.**In ancient civilizations 4.**Learn about**	2	2

			ancient documents and principles		
Oral and written tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Human rights in ancient civilizations, especially the civilization of Mesopotamia. Human rights in divine laws, with a focus on human rights in Islam.	•For the student to understand The concept of human rights as it appeared in pre-Christian civilizations. Learn about the most important ancient laws that dealt with rights. Explains how justice and rights were practiced in the Mesopotamian civilization.. Explain how divine laws dealt with the concept of rights and justice. Learn about human rights in Islam	2	3
Oral and written tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Human Rights in the Middle Ages	The student should get to know :- 1The nature of society in the Middle Ages.inEurope,andThe Islamic world, etc.) and its impact on the concept of rights. 2.Explains how human rights were affected by feudal systems.. 3.He learns about the important documents that appeared at that time, 4.It determines the individual's status, social class, and its relationship to his	2	4

			rights.		
Oral and written tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Human rights in doctrines, schools, and political theories. Human rights in corporations, their declarations, revolutions, and constitutions.	The student learns how the idea of human rights developed within**Political and intellectual theories**To distinguish between the positions of political doctrines on individual and collective rights.. And get to know**The role of philosophers and thinkers**In crystallizing the modern concept of human rights. It compares different political doctrines in their view of human rights..	2	5
Oral and written tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Human Rights in Contemporary and Modern History: International Recognition of Human Rights	• Learn about the most important historical milestones in international recognition of human rights after World War II. • Explains the role of international organizations (the United Nations, the Council of Europe, the African Union, and the League of Arab States) in formulating and protecting rights. • Explains the principles of the main international conventions and treaties	2	6

			• It reviews international and regional monitoring mechanisms for the implementation of human rights.		
Oral and written tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	International and regional recognition of human rights	For the student to know **on :-** The concept of international and regional recognition of human rights and the motives for its emergence after global wars and conflicts. Learn about the most important international agreements and conventions	2	7
Oral and written tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	NGOs and human rights	• To introduce the student to the concept of non-governmental organizations and their role in civil society. • Distinguish between types of NGOs (local, national, international) working in the field of human rights. • Learn about the most prominent international organizations defending human rights.	2	8
Oral and written tests	Presentation, explanation, questionsA	National Human Rights Organizations	The student will be able to understand what these organizations are and their role in society.	2	9

	nd answers,discussionInteractive and self-learning		They will also be able to distinguish between national organizations and international organizations working in the same field. They will also understand that these institutions monitor rights, investigate violations, and report on the human rights situation..		
Oral and written tests	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Human Rights in Iraqi Constitutions: Between Reality and Theory	The student should learn about the basic rights guaranteed by the Iraqi Constitution.. Understands the difference between the rights theoretically stipulated in the Constitution and the reality of their application in daily life. Identify the challenges facing human rights protection in Iraq in practice..	2	10
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInte	The relationship between human rights and public freedoms in the Universal Declaration of Human Rights	The student should become familiar with the concept of human rights and public freedoms as stated in the Universal Declaration of Human Rights..	2	11

	ractive and self-learning		Understands how rights and freedoms complement each other to form a system for protecting human dignity.. Learn about the most important public freedoms, such as freedom of expression, freedom of religion, and freedom of movement..		
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	The relationship between human rights and public freedoms in regional charters and national constitutions	The student should become familiar with the concept of human rights and public freedoms as stated in regional charters such as the European Convention on Human Rights, the African Charter on Human Rights, and others.. Understands how national constitutions regulate public freedoms and guarantee them among basic human rights.. Identify the similarities and differences between regional charters and national constitutions in	2	12

			protecting rights and freedoms..		
Oral and written tests and scientific reports	Explanation, questionsAnd answers,discussionInteractive and self-learning	Essential human rights and collective human rights	The student analyzes the importance of human rights in ensuring human survival and dignity.. Compares individual and collective rights in terms of application and challenges. Discusses how collective rights defend identity, culture, and diversity..		13
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Economic, social and cultural human rights, and civil and political human rights	The student should become familiar with the concept of economic, social and cultural human rights, such as the right to work, education, health, and adequate housing.. Understands the concept of civil and political human rights, such as the right to freedom, expression, political participation, and justice.. Recognizes the basic differences between economic, social and cultural rights and civil and political rights..	2	14

Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Contemporary Human Rights: The Reality of Development and the Right to a Clean Environment	The student will understand contemporary human rights and the importance of integrating them with the Sustainable Development Goals..	2	15

11. Course Evaluation:	
Tests + Exercises + Discussions + Questions	
12. Learning and teaching resources:	
Studies in Democracy and Human Rights Written by: Hadi Rabie Publisher: Dar Al-Janan for Publishing and Distribution 2016	Required textbooks (curriculum books, if any)
"Democracy and Human Rights: Concepts, Measures and Relationships" by Dr. Todd Landman, published in 2018, discusses the concepts of democracy and human rights, how to measure them, and analyze the relationships between them.	Main References (Sources)
The International Journal of Human Rights Publishes research on human rights issues around the world and international politics.	Recommended books and references (scientific journals, reports...)
https://www.ohchr.org https://www.amnesty.org https://www.hrw.org	Electronic references, websites

Course Description Form

1. Course name:
English language (1)
2. Course code:
NTU101
3. the chapterAcademic/ year
4. Description preparation date
17−7−2025
5. Available attendance forms
1. Weekly lesson schedule (theoretical)). 2. Discussions, scientific seminars, and other extracurricular activities
6. Number of credit hours (total) / Number of units (total)
7. Course Supervisor Name (List all names, if there is more than one)
the name:M.M. Omar Ahmed Fathy e-mail: omar.ah.f@ntu.edu.iq
8. Course objectives

1. The student should be able to identify all English language skills and knowledge. 2. The student should be able to encourage and develop scientific research in the fields of the English language in general. 3. The student should have the ability to cooperate with local and international organizations in the field of English language development.	**Goals**
9. Teaching and learning strategies	
1. Interactive lectures. 2. Brainstorming. 3. Dialogue and discussion. 4. Assign tasks and report. 5. Assign teamwork to reveal leadership skills.	**Strategy**

10. Course structure

Evaluation method	Teaching method	Unit name/topic	Required learning	watches	week

			outcomes		
Short exams, homework assignments, discussions	Discussion method, lecture method	theoretical:Scientific terms inYAgriculture	A2: Theoretical: To be able to know the scientific agricultural terms in the language.EnglishIn all agricultural specialties.	2 theoretic	the first
Short exams, homework assignments, discussions	Discussion method, lecture method	theoretical: Scientific terms inYFreetoPlant productionY	A2: Theoretical: To be able to know the scientific terms in the fieldPlant productionY	2 theoretic	the second
Short exams, homework assignments, discussions	Discussion method, lecture method	theoretical: Scientific terms inYFreetoAnimal productionY	A2: Theoretical: To be able to know the scientific terms in the field Animal productionY	2 theoretic	the third
Short exams,	Discussion method, lecture	theoretical: Terms Scientific in area protection plant	A2: Theoretical: To be able to know the	2 theoretic	Fourth

homework assignments, discussions	method		scientific terms in the field protection plant		
Short exams, homework assignments, discussions	Discussion method, lecture method	monthly exam	monthly exam	2 theoretic	Fifth
Short exams, homework assignments, discussions	Discussion method, lecture method	theoretical: Scientific terms inYFreetoFood Science	B2/Theoretical: To be able to know the scientific terms in the field Food Science	2 theoretic	Sixth
Short exams, homework assign	Discussion method, lecture method	monthly exam	monthly exam	2 theoretic	Seventh

ments, discuss ions					
Short exams, homew ork assign ments, discuss ions	Discussion method, lecture method	theoretical: Scientific terms inYFreetoAgricult ural Economics and Social Sciences	A1/Theoretical: To be able to know the scientific terms in the fieldAgricultur al Economics and Social Sciences	2 theoretic	The eighth
Short exams, homew ork assign ments, discuss ions	Discussion method, lecture method	theoretical: Scientific terms inYFreetoagricult ural biotechnology	B2/Theoretical: To be able to know the scientific terms in the fieldagricultur al biotechnology	2 theoretic	Ninth
Short exams, homew ork assign ments, discuss	Discussion method, lecture method	theoretical: Scientific terms inYFreetolandsYA nd water.	A2/Theoretical: To be able to know the scientific terms in the field of soil sciences.	2 theoretic	tenth

ions					
Short exams, homework assignments, discussions	Discussion method, lecture method	monthly exam	monthly exam	2 theoretic	eleventh
Short exams, homework assignments, discussions	Discussion method, lecture method	theoretical: Scientific terms in the field of agricultural engineering	B2/ To be able to know the scientific terms in the field of agricultural engineering.	2 theoretic	twelfth thirteenth
Short exams, homework assignments, discussions	Discussion method, lecture method	theoretical: Scientific terms in the field of agricultural engineering theoretical: Article review	A1/ To be able to know the scientific terms in the field of agricultural engineering. Review of all English language lectures the student received during the academic year	2 theoretic	fourteenth fifteenth

11. Course Evaluation	
((Oral exams / Written exams / Weekly reports / Daily attendance / Participation and interaction in lectures / Midterm and final exams))	
12. Learning and Teaching Resources	
Rapid Rewiw	**Required textbooks (curriculum books, if available)**
English Grammar	**Main References (Sources)**
Eurasea Article	**Recommended books and references (scientific journals, reports...)**
Lib.gin	**Electronic references and websites**

Course Description Form

1. Course name:
Computer Principles (1)
2. Course code:
NTU102
3. the chapterAcademic/ year
4. Description preparation date
17-7-2025
5. Available attendance forms
1. Weekly lesson schedule (theoretical) And my work). 2. Discussions, scientific seminars, and other extracurricular activities
6. Number of credit hours (total) / Number of units (total)
7. Course Supervisor Name (List all names, if there is more than one)
the name:M.M. Manhal Mohammed Bashir e-mail: manhalbasher@ntu.edu.iq
8. Course objectives

• The student should be able toUnderstanding the Calculator – Calculator Generations – Hardware and Software Components • The student should be able to identifyWith the most important basic information about computers, computer generations, and operating systems. • The student should be able to identifyOperating systemMS-Dos, system concept, system flag, disks, directories and their levels, files, internal and external commands.	**Goals**
9. Teaching and learning strategies	
1. Interactive lectures.	**Strategy**

2. Brainstorming. 3. Dialogue and discussion. 4. Assign tasks and report. 5. Assign teamwork to reveal leadership skills.	

10. Course structure

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	watches	week
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Introduction to computers / computer systems / information technology / types of computers / input units / central processing unit / output units	B3/The importance of computers in our daily lives and our economy Knowledge of information technology and identification of computer parts and components	1 theoretical 1 practic	the firs
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Main memory and its types / Data storage in memory / Factors affecting computer performance	A3/Learn about computers and memory types	1 theoretical 1 practic	the second
Short exams,	theoretical:Auditory methods: writing on	Definition of software and its types / Systems software:	A3/Learn how data is represented, the units of	1 theoretical	the thi

homework assignments, discussions	the board method, direct dialogue method practical:Assignment and report	operating systems / Programming languages and programming systems / Application software.	measurement used, software and compilers, and types of operating systems.	1 practic	
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Introduction toWindows / Features / Turning on the device / Shutting down the device / Using the mouse / Components of the Windows screen: Taskbar: Icons: and their types (standard and general).	B3/ The student must be able to:Get to knowsystem Windows AndLearn about window movement and how to control it.	1 theoretical 1 practic	Fourth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Control Panel / Desktop Control / Screen Saver / Window Colors and Fonts / Display Settings / Adjust Screen Colors / Modify Time and Date / Volume / Change Mouse Buttons / Control Double-Click Speed / Change Mouse Pointer / Control Mouse Speed / Install and Uninstall Programs	A3/ The student must be able to:Recognition How to use the control panel and how to make the necessary adjustments to it	1 theoretical 1 practic	Fifth

Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Minimize and maximize the window / close it permanently / close it temporarily / move the window / control the window size / methods for running applications and programs	A3/ The student should be able to know how to operate applications and programs.	1 theoretical 1 practic	Sixth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Sort list itemsstart / delete start menu items / add submenu to start menus / add new button to start menu	B3/ The student must be able to: Knowing how to sort a liststartAnd delete and add elements from it	1 theoretical 1 practic	Sevent
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Basic System Information / Turn off unwanted applications	A3/ The student must be able to: Knowing basic information about the operating system and how to work on it	1 theoretical 1 practic	The eighth

Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Windows ExplorerWindows Explorer / My Computer Icon / My Computer Window Parts	B3/ The student must be able to: Knowing the primary and secondary icons in the operating system	1 theoretical 1 practic	Ninth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Recycle Bin (delete, restore and empty the Recycle Bin) / Iconmy document	A3/ The student must be able to: Knowing how to work with the Recycle Bin and how to recover files from it and work on them	1 theoretical 1 practic	tenth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Defining Files and Folders / Identifying Files and Folders / Properties of Defining Files and Folders	A3/ The student must be able to: Defining files and folders and how to display file or folder properties	1 theoretical 1 practic	eleventh

Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Create files and folders / Rename files and folders / Move a file or folder / Copy a file or folder / Search for a file or folder / Create a shortcut icon for an application or file	B3/ The student should be able to create and delete files, change the name of each file, or create a shortcut for the application or file.	1 theoretical 1 practic	twelfth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Calculator / Notebook / Notebook / Use the notebook to edit and create the file Painter / Scre Components	B3/ The student must be able to: Use the calculator and the notes or drawing icon	1 theoretical 1 practic	thirteenth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Create drawings / Specify foreground and background colors / Choose brush stroke size / Select and select the drawing tool / Save the drawing / Make the drawing a desktop background / Finish the drawing Entertainment programs Media	B3/ The student should be able to create, save, and use graphics as desktop backgrounds.	1 theoretical 1 practic	fourteenth

		player			
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Viruses / Reason for the name / Definition / Methods of virus spread / Symptoms of virus infection / Methods of protection / Types of viruses Computer crimes / Theft / Hackers	A3/ The student should be able to identify the types of viruses that infect computers, the symptoms of virus infection, and how to protect against them.	1 theoretical 1 practic	fifteent

11. Course Evaluation	
Grades are distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily oral tests, monthly or written tests, reports, etc.	
12. Learning and Teaching Resources	
Lectures prepared by the subject teacher	**Required textbooks (curriculum books, if available)**
Metzeelaer and Scharpf/Benjamin/Cummings Pub. 1995	**Main References (Sources)**
Library, scientific websites, access to lectures from other universities	**Recommended books and references (scientific journals, reports...)**
	Electronic references and websites

Course Description Form

1. Course name:	
Arabic language	
2. Course code:	
NTU103	
3. the chapterAcademic/ year	
4. Description preparation date	
17−7−2025	
5. Available attendance forms	
1. Weekly lesson schedule (theoretical)). 2. Discussions, scientific seminars, and other extracurricular activities	
6. Number of credit hours (total) / Number of units (total)	
7. Course Supervisor Name (List all names, if there is more than one)	
the name:M.M. Amna Maher Aziz e-mail: amina.mahir@ntu.edu.iq	
8. Course objectives	
1. The student must be able toCorrect reading. 2. The student will be able toCorrect writing and good use of punctuation. 3. The student must be able toThat the student acquires the ability to use the Arabic language correctly.. 4. The student should be able to separate elements from their groups or mixtures. 5. The student should be able to pronounceWith correct Arabic words, structures and styles in an interesting way 6. Accustoming the student to expressing his ideas clearly and correctly.	**Goals**
9. Teaching and learning strategies	
1. Interactive lectures. 2. Brainstorming. 3. Dialogue and discussion. 4. Assign tasks and report.	**Strategy**

5. Assign teamwork to reveal leadership skills.	

10. Course structure					
Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	watches	week
Short exams, homework assignments, discussions	Discussion method, lecture method	Introduction to linguistic errors- The closed taa and the open taa	1. Identify types of linguistic errors. 2. Differentiating between the open taa and the closed taa	2 theoretical	the first
Short exams, homework assignments, discussions	Discussion method, lecture method	Rules for writing the extended and shortened alif - solar and lunar letters	1. Differentiating between writing the extended alif and the short alif and the places where the two alifs are written 2. Differentiating between solar and lunar letters	2 theoretical	the second
Short exams, homework	Discussion method, lecture method	Dad and Tha	Differentiate betweenDad and Tha	2 theoretical	the third

assignments, discussions					
Short exams, homework assignments, discussions	Discussion method, lecture method	Writing the hamza	Enabling the student toWriting the hamzaCorrect writing	2 theoretical	Fourth
Short exams, homework assignments, discussions	Discussion method, lecture method	punctuation marks	Get to knowSignsPunctuationAnd write it in the correct place	2 theoretical	Fifth
Short exams, homework assignments, discuss	Discussion method, lecture method	Noun, verb, and the difference between them	1. Identify the noun and the verb and state the sign of each. 2. Differentiating between nouns and verbs 3. Explaining	2 theoretical	Sixth

ions			the types of verbs 4. Differentiating between types of verbs		
Short exams, homework assignments, discussions	Discussion method, lecture method	Effects	Recognizing the types of objects and differentiating between them	2 theoretical	Seventh
Short exams, homework assignments, discussions	Discussion method, lecture method	number	Enabling the student to write numbers correctly	2 theoretical	The eighth
Short exams, homework assignments, discuss	Discussion method, lecture method	Common language errors applications	Get to know Common language errorsAnd avoid it	2 theoretical	Ninth

ions					
Short exams, homework assignments, discussions	Discussion method, lecture method	Common language errors applications	Get to know Common language errorsAnd avoid it	2 theoretical	tenth
Short exams, homework assignments, discussions	Discussion method, lecture method	Noon and Tanween - Meanings of Prepositions	1. Differentiating between the letter noon and the letter tanween 2. Recognizing the meanings of prepositions	2 theoretical	eleventh
Short exams, homework assignments, discussions	Discussion method, lecture method	Formal aspects of administrative discourse	Get to know Formal aspects of administrative discourse	2 theoretical	twelfth
Short	Discussion method,	Language of administrative	Getting to know the language of	2 theoreti	thirteenth

exams, homework assignments, discussions	lecture method	discourse	administrative discourse	cal	
Short exams, homework assignments, discussions	Discussion method, lecture method	Language of administrative discourse	Getting to know the language of administrative discourse	2 theoretical	fourteenth
Short exams, homework assignments, discussions	Discussion method, lecture method	Models From administrative correspondence	Get to knowModelsFrom administrative correspondence	2 theoretical	fifteenth
11. Course Evaluation					
((Oral exams / Written exams / Weekly reports / Daily attendance / Participation and interaction in lectures / Midterm and final exams))					
12. Learning and Teaching Resources					
Required books:				**Required**	

General Arabic Language Book for Technical Universities(Dr. Safaa Kazim MakkiandDr. Lama Mohammed Younis	**textbooks (curriculum books, if available)**
1- Clear Dictation: Abdul Majeed Al-Naimi, Daham Al-Kayyal, Dar Al-Mutanabbi Library, Baghdad, 6th edition, 1987 AD. 2- Lessons in language, grammar and spelling for state employees: Ismail Hamoud Atwan and others, Ministry of Education Press No. (3), Baghdad, 2nd ed., 1984 AD. 3- Arabic Language for the Third Intermediate Grade: Fatima Nazim Al-Attabi, and others, 1st ed., 2018 AD. 4- General Arabic for Non-Specialization Departments: Abdul Qader Hassan Amin and others, Ministry of Higher Education and Scientific Research, 2nd ed., 2000. Inspired by Arabic Literature: Hafal Muhammad Amin, Al-Saado Press, Baghdad.	**Main References (Sources)**
Lessons in language, grammar and spelling for state employees, Ismail Hamoud Atwan and others, Ministry of Education Press No. (3), Baghdad, 2nd ed., 1984 AD.	**Recommended books and references (scientific journals, reports…)**
	Electronic references and websites

Course Description Form

1. Course name:	
mathematics	
2. Course code:	
TAMO101	
3. Level/Academic Year:	
Levelfirst/ 2024 - 2025	
4. Description preparation date:	
17-7-2025	
5. Available attendance forms:	
Paper form including name, date of attendance and signature	
6. Number of credit hours (total) / Number of units (total):	
60/1	
7. Name of course supervisor (mention all names if there are multiple supervisors):	
the name:Qahtan Dhiyab Salman Saleh Al-Dhiyab amyl:Qahtan.Th.Salman@ntu.edu.iq	
8. Course objectives:	
• **That the bachelor's student be able to**: • The student understands the concept of a function and can define it.. • The student should distinguish between a relationship and a function.. • The student will learn about the types of functions (such as: linear,	**Course objectives**:

quadratic, exponential…).

- The student represents the functions graphically on the coordinate system..
- The student finds the value of the function for a given number.(The value of the function at a given x).
- The student must determine the domain and range of the function..
- The student solves simple problems using the laws of functions..
- The student explains the change in the function (e.g., increase, decrease, stability).

General objectives Formathematics

1. Developing the student's understanding of basic mathematical concepts.
2. Developing logical thinking and mathematical reasoning skills.
3. Enable the student to use basic arithmetic operations (addition, subtraction, multiplication, division) accurately..
4. Developing the ability to solve mathematical problems in organized steps.
5. Training the student to use mathematical symbols and expressions correctly.
6. Enhancing graphic representation and data reading skills.
7. Enabling the student to use mathematics in everyday life situations.
8. Developing skills of analysis, comparison and classification in mathematical concepts.
9. Enhancing accuracy and attention in sports.
10. Developing self-confidence when dealing with mathematical problems and ideas.
11. Using educational and technical means to facilitate the learning of mathematical concepts.
12. Linking mathematics to other sciences and clarifying its role in different areas of life.

9. Teaching and learning strategies:	
1. Dialogue-based learningAnd discussion. 2. Brainstorming. 3. learningCooperative. 4. Learning based onSimulation.	Strategy:

5. Practical training 6. LearningMSelf.	

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	watches	week
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	functions	The student understands the concept of a function as a relationship that links two or more variables in an organized way. **For the student to know**On the basic components of a function, such as: domain, range, and function rule. **To differentiate the student**Between different types of functions (linear, quadratic, fractional, exponential, and logarithmic). **For the student to know**On how to graph functions using coordinates. The student will analyze the properties of functions in terms of increasing, decreasing, symmetry, and terminal behavior. The student will be	1	1

			able to distinguish between different functions through their properties and graphical representation. The student will apply the concept of functions to solve mathematical and life problems.		
Test + Questions and Answers + Exercise Solutions	Lecture + Presentation + Explanatory Notes	Derivative of algebraic functions	**For the student to understand**The concept of the derivative as a mathematical tool for measuring the instantaneous rate of change of a function at a given point. The student will learn the properties of algebraic functions that can be derived. The student will be able to distinguish between the types of algebraic functions and their different limits when applying differentiation. The student should apply basic derivation rules, such as: • Derivative of a constant • Derivative of power • multiplication rule • division rule The student will	1	2

			solve mathematical problems that require the use of differentiation rules to find the first derivatives. **The student should use**Derivatives in explaining instantaneous changes in life and scientific contexts (such as speed, growth, or decline).		
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Integration of algebraic functions	**For the student to understand**The concept of integration as a mathematical tool for finding the original function or calculating areas under curves. The student will learn the relationship between integration and differentiation as two inverse operations. The student should be able to distinguish between the types of algebraic functions that can be integrated (polynomial, rational, radical). The student will apply the basic rules of integration to different types of algebraic functions. The student will solve mathematical problems involving	1	3

			the calculation of indefinite and definite integrals. The student will use integration to solve applied problems in fields such as engineering, physics, and economics. **To connect the student**Between integration and understanding quantitative changes through space representation and mathematical modeling.		
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Non-algebraic functions: logarithmic function - derivative of logarithmic function	**For the student to understand**The concept of the logarithmic function as a non-algebraic function used in modeling phenomena with relative change. **For the student to know**On the properties of the general and natural logarithmic function, and its graphical representation. The student will be able to distinguish between the different forms of the logarithmic function, and determine its domain, range, and terminal behavior.	1	4

			The student will apply the rules of differentiation to calculate the derivatives of logarithmic functions. The student will use the chain rule to derive complex expressions containing logarithmic functions. The student will solve mathematical problems involving logarithmic functions in applied contexts. The student will analyze logarithmic models related to scientific and economic phenomena such as population growth and radioactive decay.		
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Integration of a logarithmic function	**For the student to understand**The concept of integration of a logarithmic function and its importance in mathematical and scientific applications. **For the student to know**On the indefinite integral of a functionln(x)\ln(x)ln(x). **The student must**	1	5

			applyIntegration techniques suitable for solving integrals containing logarithmic functions, such as:: **Compensation method** **Integration by parts method** **The student must solve**Problems involving complex logarithmic expressions that require combining more than one integration technique.. **To connect the student**Between logarithmic integration skills and applications in fields such as physics, engineering, and economics.. **The student explains**Integration results in life and scientific contexts, such as exponential growth and logarithmic regression..		

Test + Questions and Answers + Exercise Solutions	Lecture + Presentation + Explanatory Notes	Exponential function: Derivative of the exponential function	**For the student to understand**The concept of an exponential function as a non-algebraic function used to describe phenomena with accelerated growth or change. The student will learn about the natural exponential function exe^xex and the exponential functions with a general base axa^xax, and the properties of each. The student will be able to distinguish between the graphical representations and terminal behavior of different exponential functions. The student will apply the rules for differentiating simple	1	6

			and complex exponential functions. **The student should use**Chain rule for deriving expressions containing complex exponential functions. The student will solve applied problems involving exponential changes in fields such as physics, biology, economics, and engineering. **The student explains**Differentiation results in life and scientific contexts to understand rapid changes and dynamic models.		
Oral, written and daily practical tests and scientific	Presentation, explanation,	Integration of an exponential function	**For the student to understand**The concept of integration	1	7

reports	questionsAnd answers,discussionInteractive and self-learning		of exponential functions, and its importance in mathematical modeling and practical applications. **For the student to know**On the basis of the indefinite integral of the natural exponential functionexe^xex and functions of the form axa^xax. **The student must apply**Basic rules for integrating exponential functions in their simple and complex forms. **The student should use**Appropriate integration techniques such as substitution for integrating expressions containing		

			exponential functions. **The student must solve**Definite and indefinite integrals involving exponential functions in mathematical and applied contexts. **The student explains**Integration results in practical applications from areas such as population growth, compound interest, and radioactive decay.. **To connect the student**Between the integration of exponential functions and models used in physics, biology, economics, and engineering.		
Written exam		First semester	Assess student	1	8

		exam	understanding		
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Trigonometric functions: derivative of trigonometric functions, integral of trigonometric functions	To enable the student to understand the importance of integrating trigonometric functions in the mathematical modeling of periodic phenomena in the natural and engineering sciences. **For the student to know**On the basic rules of integration of trigonometric functions such as: • sin⁡(x)\sin(x)sin(x), cos⁡(x)\cos(x)cos(x), tan⁡(x)\tan(x)tan(x), and others. The student should apply appropriate integration methods, such as: • Direct integration • Compensation method The student will use trigonometric transformations (such as trigonometric identities) to simplify integral expressions involving powers or	1	9

			complex angles. The student will solve applied problems involving trigonometric functions related to waves, vibrations, and periodic motion. To enable the student to link the mathematical skills of trigonometric integration with their practical applications in fields such as engineering, physics, and acoustics. The student will be able to interpret integration results in the context of periodic phenomena such as alternating electric currents or simple harmonic motion.		
Test + Questions and Answers + Exercise Solutions	Lecture + Presentation + Explanatory Notes	Integration of implicit functions	The student will understand the concept of implicit functions and the reasons for using them when the relationships between variables are not explicit. **The student gets to know**On the steps of implicit differentiation and extracting implicit derivatives from non-	1	10

			explicit mathematical relationships. **The student must apply**Implicit differentiation techniques in the integration of relations not subject to explicit solvation. The student will use substitution methods to simplify and integrate expressions containing implicit functions. **The student solves**Integration problems involving implicit relationships between variables in engineering or physical contexts. The student will be able to link implicit integration with realistic modeling that requires dealing with indirectly related variables. **The student explains**Implicit integration results in applications such as the motion of objects in nonlinear paths or		

			complex physical systems..		
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Differentiation of implicit functions	**For the student to understand**The concept of implicit differentiation as a tool for deriving derivatives when the relationship between variables is not expressed in an explicit form. The student will learn the basic steps for deriving implicit equations using the chain rule. The student will apply implicit differentiation to extract dydx\frac{dy}{dx}dxdy in equations containing xxx and yyy that are implicitly related. **The student should use**The chain rule is used precisely when dealing with derivatives in implicit equations, especially when complex expressions are involved..	1	11

			The student will solve mathematical problems that contain implicit relationships between variables in theoretical and applied contexts. To enable the student to link implicit differentiation to its practical applications in the fields of engineering, physics, and natural sciences. **The student explains**Implicit derivation results in contexts that require dealing with nonlinear equations or complex interconnected relationships..		
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Integration methods: integration by parts	The student will apply the method of integration by parts to problems involving the product of functions (such as polynomials, logarithmics, trigonometrics, and exponentials). The student will solve complex integrals that require more than one step	1	12

			using integration by repeated parts. The student will be able to interpret the results of integration in applied contexts in the fields of mathematics, physics, and engineering. The student develops analytical and strategic skills in choosing integral parts to simplify complex expressions.		
Written exam		Second semester exam	Assess student understanding	1	13
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd answers,discussionInteractive and self-learning	Solving differential equations	AThe student will understand the concept of differential equations and their importance in describing changing phenomena in the natural sciences and engineering.. The student will be able to classify differential equations based on their order and linearity. The student will	1	14

			apply basic solution methods for differential equations according to their order and linearity. The student will analyze the behavior of dynamic systems using differential equations. To explain the role of differential equations in analyzing mathematical models and predicting outcomes in fields such as physics, economics, and biology. To develop the student's skills in using differential equations to solve real-world problems and provide practical solutions.		
Oral, written and daily practical tests and scientific reports	Presentation, explanation, questionsAnd	Solving differential equations	To enable the student to understand the importance of differential equations	1	15

	answers,discussionInteractive and self-learning		as a mathematical tool for describing changing phenomena in the fields of physics, engineering, and economics. The student will be able to classify differential equations according to the order of the derivative and the type of linearity. The student will apply the main solution methods for first-order differential equations, such as separable equations and linear equations. The student will apply the method of solving second-order differential equations with constant coefficients using the characteristic equation. The student will explain how to use general and special solutions to describe the behavior of		

			dynamical systems. To develop analytical skills that enable the student to understand advanced mathematical models and apply them in various scientific and real-life situations.		

11. Course Evaluation:	
Tests + Exercises + Discussions + Questions	
12. Learning and teaching resources:	
The vocabulary prescribed by the Ministry of Higher Education and Scientific Research	Required textbooks (curriculum books, if any)
Applications in calculus **Written by Dr. Salman bin Abdul Rahman Al-Salman** **Dr. Ibrahim Deeb Sarmini** **INTRODUCTION TO MATHEMATICAL ECONOMICS Third Edition** **EDWARD T. DOWLING, Ph.D.**	Main References (Sources)
Google Scholar, the scientific researcher portal	Recommended books and references (scientific journals, reports…)
All sites that provide reliable sources	Electronic references, websites

Course Description Form

1. Course name:	
Surveying and engineering drawing	
2. Course code:	
102 TAMO	
3. Level/Academic Year:	
Levelthe first/Chapter Two	
4. Description preparation date:	
17/7/ 2025	
5. Available attendance forms:	
Paper form including name, date of attendance and signature	
6. Number of credit hours (total) / Number of units (total):	
90/6	
7. Name of course supervisor (mention all names if there are multiple supervisors):	
Name: Mahmoud Shaker Mahmoud Email:msh41551@ntu.edu.iq	
8. Course objectives:	
1.Introducing the student to the most important basic information aboutTechnologiesModern used inThe field of geometryHow to use them and choose the best ones. 2. Teaching and training students to use specialized machines in the field.Survey the surface of the land that is concernedIn fields, slaughterhouses, and barnsand many other fields. 3. Teaching and training the student to choose the type of machine.Or the appropriate tools to work on each project.	Course objectives:
9. Teaching and learning strategies:	

1. The learner acquires skills in using new and modern techniques in surveying and computer drawing. 2. Teaching the student how to manage the work site using the best devices and tools to obtain the best and most accurate results in the shortest time. 3. The student will develop his ideas in the future with equipment and machines that are compatible with the nature of the areas where the field survey is conducted.	**Strategy:**

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	watches	week
Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation + Explanatory notes	General concepts of surveying	The student will be able to understand the concepts and basics of surveying.	4	1
Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation + Explanatory notes	Devices and tools used in measurement	The student will learn how to use a measuring tape.-The series-Pointer, peg, string and plumb linelike thatUse and maintenance of tools	4	2
Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation +	Types of units of measurement and their conversions	The student will learn the standard units used in surveying, the types of measurement systems, and their conversions.	4	3

	Explanatory notes				
Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation + Explanatory notes	drawing scale	The student will learn how to use the drawing scale, its types, and how to extract the actual dimensions from maps using the drawing scale.	4	4
Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation + Explanatory notes	Corrections needed in measuring distances	The student will learn - Correction for length bar difference - Correction for the difference in elevation between two points Correct the error by routing	4	5
Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation + Explanatory notes	Scanning with chain and tape	The student will learn to extract dimensions, areas and all field work.	4	6
Test+Questions Answers + Exercise	Lecture + Presentation My	Topographic maps and their uses	The student will learn how to interpret and read maps.	4	7

solutions	presentation + Explanatory notes				
Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation + Explanatory notes	Surveying with a compass	The student will have knowledge of the types and parts of the compass, methods of compass observation, as well as correcting compass observations and drawing polygons.	4	8
Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation + Explanatory notes	Theodolite	The student will learn the components of the theodolite, its uses, and how to use it practically.	4	9
		First exam		4	10
Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation + Explanatory notes	AutoCAD program	The student will learn what AutoCAD is and its uses.	4	11

Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation + Explanatory notes	Using the program's user interface and how to adjust all settings	The student will learn to use drawing commands (lines, circles, rectangles, arcs, polygons, segmentation, etc.). They will also use the modify commands to copy, move, rotate, scale the drawing, and many other uses.	4	12
Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation + Explanatory notes	Learn the different ways to draw geometric shapes.	The student will learn how to draw squares, rectangles, and different types of triangles with rhombus shapes.	4	13
Test+Questions Answers + Exercise solutions	Lecture + Presentation My presentation + Explanatory notes	How to use a commandLINE to draw different geometric shapes, such as English letters like HEF -L	The student will be able to draw diagrams of poultry farms, fields and halls.	4	14
		Practical applications		4	15

11. Course Evaluation:	
Tests + Exercises + Discussions + SubmissionsQuestions	
12. Learning and teaching resources:	
City Survey Book 102 / General Organization	Required textbooks (curriculum books, if

for Technical Education and Vocational Training / Kingdom of Saudi Arabia AutoCAD program	any)
	Main References (Sources)
	Recommended books and references (scientific journals, reports...)
	Electronic references, websites

Course Description Form

1. Course name:	
flat area	
2. Course code:	
TAMO103	
3. the chapterAcademic/ year	
4. Description preparation date	
17−7−2025	
5. Available attendance forms	
1. Weekly lesson schedule (theoretical) And my work). 2. Discussions, scientific seminars, and other extracurricular activities	
6. Number of credit hours (total) / Number of units (total)	
2/60	
7. Course Supervisor Name (List all names, if there is more than one)	
the name:Dr. Ahmed Faris Salem e-mail: ahmedalsawaf@ntu.edu.iq	
8. Course objectives	
1. The student should be able toLearn about space, its divisions, types and uses. 2. The student should be able toLearn how to take measurements, set up columns, and project them. 3. The student should have knowledge of errors, their types, and ways to overcome them. 4. The student should be able toLearn about mapping and drawing scales 5. The student should be able toIdentify obstacles and impediments in measuring distances and recording them in the field notebook.	**Goals**
9. Teaching and learning strategies	
1. **Interactive lectures.** 2. **Brainstorming.** 3. **Dialogue and discussion.** 4. **Field training.**	**Strategy**

5. Practical exercises. **6. Field project.** **Self-learning.**	

10. Course structure

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	watches	week
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	theoretical:Definition of area - its divisions - its types - its uses - field notebook practical:Field exercise using the field notebook on campus	The student should be able to define area, know its types and names, and how to use measuring tools.	1theoretical 3practic	the firs
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	theoretical: Measuring distances - its cases - erecting and lowering columns practical: Field exercises in measuring distances with different tools and using a field notebook	The student should be able to Measuring distances and their solutions and how to erect and lower columns	1theoretical 3practic	the second
Short exams, homework	theoretical:Auditory methods: writing on the board method,	theoretical: Types of errors and ways to overcome them in measuring distances	The student should be able to identify the types of measurement errors and ways to overcome them and correct measurements in	1theoretical 3practic	the thi

assign ments, discuss ions	direct dialogue method practical:As signment and report	practical: Correcting errors in measuring distances from the previous week	distances.		
Short exams, homew ork assign ments, discuss ions	theoretical:A uditory methods: writing on the board method, direct dialogue method practical:As signment and report	theoretical: Obstacles and obstacles in measuring distances practical: Draw a polygon around a building to overcome the drawn obstacles.	The student should be able to Understand the types of obstacles faced in measuring distances	1theor etical 3practic	Fourth
Short exams, homew ork assign ments, discuss ions	theoretical:A uditory methods: writing on the board method, direct dialogue method practical:As signment and report	theoretical: Mapping - Types of maps - Map scales - Methods of reducing and enlarging maps practical: From the above information, draw a map of a specific location in the institute, while training the students on some symbols and terms in mapping.	The student should be able to Drawing maps, knowing the type of each one, and methods of reducing and enlarging maps	1theor etical 3practic	Fifth
Short exams,	theoretical:A uditory methods:	theoretical:Flat panel scanning - tools - advantages -	The student should be able to identify the flat panel, its tools,	1theor etical	Sixth

homework assignments, discussions	writing on the board method, direct dialogue method practical:Assignment and report	disadvantages - conditions of use practical:Learn about the flat plate, its tools, and lifting beams using the beam + front cross method.	advantages, disadvantages, and conditions for its use.	3practic	
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	theoretical: Methods of using the flat plate - the beam method - the front cross method practical: Reverse rotation and intersection method	The student should be able to Measuring the area of a flat newspaper using different methods	1theoretical 3practic	Seventh
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	theoretical: Flat plate methods - Rotation method - Reverse intersection method practical: Exercises in measuring areas by dividing them into triangles	The student should be able to Measuring areas using the surface sheet method and the rotation method	1theoretical 3practic	The eighth
Short exams,	theoretical:Auditory methods:	theoretical: Measuring areas using the field	The student should be able to Dividing the land plot into	1theoretical	Ninth

homework assignments, discussions	writing on the board method, direct dialogue method practical:Assignment and report	method - dividing the plot of land into triangles - erecting columns at equal intervals practical: Exercises in measuring areas by erecting columns at equal distances + two centimeters	triangles and measuring the area using the field method	3practic	
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	theoretical:Smyson's rule - placing columns at unequal intervals practical:Exercises on measuring areas by erecting columns at unequal intervals	The student should be able to place columns on the map using Smyson's rule.	1theoretical 3practic	tenth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	theoretical:Measurements on a map - Dividing the land into triangles - Using squares practical:Map exercises to measure areas by dividing them into triangles + squares	The student should be able to Use the squares on the map to divide it into triangles and measure them.	1theoretical 3practic	eleventh

Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	theoretical: Using the planning scale practical: Use a surveying device to measure areas on maps.	The student should be able to Using planning metrics	1theoretical 3practic	twelfth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	theoretical: Prismatic Compass - Magnetic and True North - Angles of All Kinds practical: Getting to know the prismatic compass - its parts - its uses - taking readings from it	The student should be able to Knowing the types of compass and determining directions and angles of all kinds	1theoretical 3practic	thirteenth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	theoretical: Reading angles between sides using a compass practical: Draw a polygon around a building and mark its corners.	The student should be able to Using a compass to read angles between sides	1theoretical 3practic	fourteenth
Short	theoretical:Auditory	theoretical:Calculating interior angles	The student should be able to	1theoretical	fifteent

exams, homework assignments, discussions	methods: writing on the board method, direct dialogue method practical:Assignment and report	and directions of polygons using a compass practical:Perform calculations from the previous week and draw a map of the building.	Using a compass to determine the interior angles and directions of polygons	3practic	

11. Course Evaluation	
Grades are distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily oral tests, monthly or written tests, reports, etc.	
12. Learning and Teaching Resources	
Remember all the textbooks if any.	**Required textbooks (curriculum books, if available)**
Mention references (sources) if any.	**Main References (Sources)**
Scientific journals, reports and research relat to flat area.	**Recommended books and references (scientific journals, reports...)**
All sites related to space and topography	**Electronic references and websites**

Course Description Form

1. Course name:	
General Chemistry	
2. Course code:	
TAMO104	
3. Level/Academic Year:	
Level 1	
4. Description preparation date:	
17−7−2025	
5. Available attendance forms:	
Paper form containing name, Date of attendance and signature	
6. Number of credit hours (total) / Number of units (total):	
2/60	
7. Name of course supervisor (mention all names if there are multiple supervisors):	
Name: Dr. Hala Aouf Abdel Rahman amyl: dr_hala.awf.chilmeran@ntu.edu.iq	
8. Course objectives:	
At the end of the course, the student is expected to be able to: 1. Understand the basic concepts ofChemistry and Solution Preparation 2. Explain the mechanismsHeat changes accompanying chemical reactions 3. IdentifyTypes of chemical reactions and how to represent them with equations 4.Analyzing and interpreting laboratory results in a scientific manner 5. Understanding the relationship betweenMolar, normal, and percentage concentrations 6. Identify theChemical bonds and their types	**Course objectives:**

7.Building a scientific foundation that qualifies students to study organic and analytical chemistry	

9. Teaching and learning strategies:

There are many effective strategies for teaching the subject.**General Chemistry**, which aims to promote a deep understanding of genetic concepts and develop critical thinking skills.They have: 1. Learning based on dialogue and discussion. 2. brainstorming. 3. cooperative learning. 4. simulation-based learning. 5. Practical training. 6. Self-learning.	Strategy:

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	watches	week
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Introduction to Chemistry and Solution Preparation	1- The student should know the basic concepts in chemistry and methods of preparing solutions. 2- The student understands the chemical properties of elements. 3- The student will be able to deduce the relationship	4	1

			between molar and normal concentrations to prepare solutions.		
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Periodic table of chemical elements	1- that Ito understandThe studentProperties of chemical elements and their classification in the periodic table 2- that IcustomStudent Chemical Properties of ElementsTransition and its interactions. 3- The student can deduce the properties of the elements in the periodic table by classifying them into groups and periods according to their chemical properties.	4	2
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Atomic structure	1- The student should understand the properties and composition of the atom.	4	3

			2-thatThe student knows Dalton's atomic model. 3- The student can deduce the types of chemical bonds of compounds through their atomic structure.		
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Electronic theory of valence	1- The student should know the electronic theory of valence. 2- The student will understand the advantages and disadvantages of the electronic theory of valence. 3- The student will apply the concept of electronic valence theory to a number of chemical compounds.		4
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Types of chemical bonds	1-To know The studentTypes of chemical bonds 2- The student understands the advantages ofIonic and	4	5

			covalent compounds. 3- The student will be able to infer the strength of the compound's bond by identifying the properties of chemical bonds.		
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Acids, bases and salts	1- The student should know the Arrhenius and Bronsted concepts of acids and bases. 2- The student understandsLewis concepts of acids and bases 3. The student can deduce the strength of acids and bases through:Arrhenius and Brønsted concept of acids and bases	4	6
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Oxidation-reduction reactions	1- The student should complete the chemical balance. 2- The student will understand the mathematical examples of oxidation and reduction reactions. 3- The student will be able to	4	7

			deduce the importance of oxidation-reduction reactions and their applications, such as electrical cells.		
Questions and answers + exercise solutions	Lecture, presentation, illustrations	halogens	1- The student will understand the general properties of halogens. 2- The student will learn how to prepare halogens. 3- To conclude the importance of halogens and their applications in the sterilizer industry.	4	8
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Electrochemistry	1- The student will understand electrochemical and electrolytic cells. 2- To understand the principle of cell functionElectro chemical and electrolytic 3- The student will	4	9

			be able to deduce the oxidation and reduction reactions of electrical and electrolytic cells.		
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Metallic and non-metallic elements	1- The student will learn about oxidation potential and electron affinity. 2- The student understands ionization energy. 3- The student will be able to deduce the properties of metallic and non-metallic elements.	4	10
Questions and answers + exercise solutions	Lecture, presentation, illustrations	General properties of the elements in Group 4	1-For the student to knowonGeneral properties of the elements in Group 4 2-The student should get to knowExamplesFor elements in group 4. 3- The student	4	11

			will conclude the importance of the elements of the fourth group in the periodic table in semiconductor technology, such as germanium and silicon.		
Questions and answers + exercise solutions	Lecture, presentation, illustrations	General properties of the elements in Group 5	1- The student should be familiar with the general properties of the elements in the group.Fifth 2. The student should identify examples of elements in the group.fifthAnd. 3- The student will be able to conclude the importance of the elements of the fifth group in various applications such as nitrogen fertilizers and pesticides.	4	12
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Ideal and real gases	1- To familiarize the student with the properties of ideal gases. 2- The student	4	13

			understands the laws and mathematical examples.toIde al and real gases 3- The student should conclude the basic difference betweenIdeal and real gases in terms of molecular size and the forces of attraction between them		
Questions and answers + exercise solutions	Lecture, presentatio n, illustrations	Standard tensile effort	1- The student should be familiar with the standard hydrogen potential. 2- The student should know the standard calomel electrode potential. 3- The student concludes that the standard hydrogen electrode potential is a reference for measuring	4	14

			electrode potentials.Other elements		
Questions and answers + exercise solutions	Lecture, presentation, illustrations	nuclear chemistry	1- The student should get to knowThe concept of nuclear chemistry and its areas of application 2- The student should knowTypes of nuclear radiation and their uses. 3. The student will be able to deduce the radioactivity of elements by identifying the nuclear properties of radioactive elements.	4	15

11. Course Evaluation:	
Tests + Exercises + Discussions + SubmissionsQuestions	
12. Learning and teaching resources:	
The vocabulary prescribed by the Ministry of Higher Education and Scientific Research	Required textbooks (curriculum books, if any)
• Principles of General Chemistry, Dr. Mohi El-Din Al-Bakoush 2024	Main References (Sources)
Google Scholar, the scientific researcher portal	Recommended books and references (scientific journals, reports...)
All sites that provide reliable sources and also artificial intelligence tools	Electronic references, websites

Course Description Form

1. Course Name:	
Animal environment and behavior	
2. Course Code:	
ANP 101	
3. Semester / Year:	
Semester	
4. Description Preparation Date:	
17/7/2025	
5. Available Attendance Forms:	
Attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
78 / 8	
7. Course administrator's name (mention all, if more than one name)	
Name: Ameen Raaed Ali Email: ameen.r.ali@ntu.edu.iq	
8. Course Objectives	
Course Objectives	**• Introducing students to the most important environmental factors: Students learn about the factors that affect living organisms and how the organism itself affects its surrounding environment.** **• Developing skills in studying animal behavior: Students learn methods for studying animal behavior and environmental interactions.** **• Educating students about environmental protection: The course highlights the role of humans in the environment and the importance of preserving it.**
9. Teaching and Learning Strategies	
Strategy	Course Outcomes Definition: A set of knowledge, skills, and values that a course

	seeks to achieve in students. Importance: It provides the learner with a clear idea of what they will be able to do after completing the course, and it helps in designing and evaluating courses. How They Are Determined: Course outcomes are determined based on the objectives of the academic program to which the course belongs.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student will be introduced to the concept of ecology.	Introduction to Ecology	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student will be introduced to climatic factors and their impact on the animal's environment.	Climate Factors and Their Impact on the Environment and Animals	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will be introduced to how the body regulates its temperature.	Body Temperature Regulation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will be introduced to camels' adaptations to living in desert environments.	Camels and the Desert Environment	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student will be introduced to how animals maintain their body temperature.	Thermogenesis in the Animal Body and Glands	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	The student will be introduced to the methods of heat loss.	Heat Loss	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	The student will be introduced to animal behaviors.	Animal Behavior	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	The student will be introduced to the types of behavior in animals.	Types of Animal Behavior	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	The student will be introduced to the most prominent types of	Cattle Behavior	Presentation, explanation, questions and	Oral, written and daily practical tests and scientific

		livestock behaviors.		answers, discussion	reports
10	5	The student will be introduced to the behavior of sheep.	Sheep Behavior	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	The student will be aware of the dangers of pollution and their impact on the animal's environment.	Pollution	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student will be introduced to how to approach animals.	Animal Approaches	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student will be introduced to methods of controlling livestock.	Cattle Control Methods	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student will be introduced to how to bed cows and the methods used for bedding.	Cattle Resting Methods	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student will be able to understand field operations.	Field Operations	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Animal Behavior, Ahmed Hammad Al-Hussaini
Recommended books and references (scientific journals, reports…)	book Ecology and animal behavior, Edward M. Barrows
Electronic References, Websites	علم السلوك الحيواني - ويكيبيديا (wikipedia.org)

Course Description Form

1. Course Name:
Zoological techniques
2. Course Code:
ANP 102
3. Semester / Year:
Semester 2 / Year 1
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hr. / 3 Units
7. Course administrator's name (mention all, if more than one name)
Name: Waseem Amer Hashem Email: wasseem_amer@ntu.edu.iq
8. Course Objectives
Course Objectives • **1. Understanding the Structure and Function of Animals: The study of different organs and biological systems and how they function.** • **2. Animal Classification: Identifying and classifying different species based on common characteristics.** • **3. Animal Behavior: The study of how animals interact with each other and their environment.** • **4. Embryology: Understanding the stages of embryonic development in different animals.** • **5. Ecological Distribution: The study of how animals are distributed in different environments and the effects of environmental factors on them.**
9. Teaching and Learning Strategies

Strategy	1. Active Learning: Includes group discussions, case studies, collaborative learning, and role-playing. 2. Brainstorming: Used to generate ideas and stimulate creative thinking, particularly in analyzing problems or developing new solutions. 3. Project-Based Learning: Suitable for animal production courses through research projects or evaluation of breeding systems. 4. Problem-Based Learning: Presents a real-life problem and encourages students

	to analyze it and search for scientific solutions. 5. Interactive Lecture Strategy: Combines traditional lectures with questions, short discussions, and demonstrations. 6. Blended Learning: Combines traditional learning with e-learning. 7. Cooperative Learning: Relies on dividing students into working groups to solve a task or understand a topic. 8. Discussion and Dialogue: Suitable for controversial or ethical topics such as animal welfare or environmental values.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student should know the concept of zoology.	definition of poultry science.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student will learn about the types and shapes of animal cells.	The conditions that must be taken into account when classifying cell types.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will be able to distinguish between DNA.	RNA in animal cells.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student should know how tissue and organ are formed from cells.	The origin and classification of tissue.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student will learn about the function of the digestive system in farm animals.	Sections of the digestive system.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	The student should know the microscope and its parts.	What is a microscope made of?	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	The student should know the types of microscopes and their.	functions.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	The student	functions.	Presentation,	Oral, written and daily practical tests

		should know the shapes of animal cells and their.		explanation, questions and answers, discussion	and scientific reports
9	5	The student should know the divisions of animal cells.	The stages of division.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	Living and non-living cell components and their .	functions in the animal cell	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	The student should be able to distinguish between vertebrates and invertebrates.	relationship to comparative anatomy.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student should learn about the respiratory system and the excretory system.	function of each system.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student should learn about the reproductive system and glands.	function of each gland.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student will be able to study in detail the people of the Hawanid Kingdom.	divisions.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student should be able to distinguish between living and non-living.	components.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Zoology and Anatomy
Main references (sources)	Authored by Zahraa Muslim Hassan
Recommended books and references (scientific journals, reports…)	**he Journal of Basic and Applied Zoology (JOBAZ)**
Electronic References,	https://sc.uobaghdad.edu.iq/wp-

Websites	content/uploads/sites/64/2022/12/%D8%B9%D9%84%D9%85-%D8%A7%D9%84%D8%AD%D9%8A%D9%88%D8%A7%D9%86-%D8%A7%D9%84%D8%B9%D8%A7%D9%85.pdf

Course Description Form

1. Course Name:	
Poultry production techniques	
2. Course Code:	
ANP 103	
3. Semester / Year:	
Semester	
4. Description Preparation Date:	
17/7/2025	
5. Available Attendance Forms:	
Attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
78 / 8	
7. Course administrator's name (mention all, if more than one name)	
Name: Ameen Raaed Ali Email: ameen.r.ali@ntu.edu.iq	
8. Course Objectives	
Course Objectives	**• Provide students with basic knowledge about the types of poultry used in production, including meat and egg production.** **• Learn about the latest technologies used in poultry farm management, such as feeding systems, lighting, and climate control.** **• Analyze the impact of nutrition and breeding on poultry product quality and production efficiency.** **• Use modern technologies such as artificial intelligence and sensors to improve production and reduce waste.**
9. Teaching and Learning Strategies	
Strategy	Course Outcomes

	Definition: A set of knowledge, skills, and values that a course seeks to achieve in students. Importance: It provides the learner with a clear idea of what they will be able to do after completing the course, and it helps in designing and evaluating courses. How They Are Determined: Course outcomes are determined based on the objectives of the academic program to which the course belongs.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student will understand the concept of poultry science.	Introduction to Poultry Science	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student will understand the steps for establishing poultry farms.	Conditions to Consider When Establishing Poultry Farms	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will distinguish between types of poultry housing.	Types of Poultry Housing	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will understand the types of poultry.	Origin and Classification of Poultry	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student will understand poultry breeds.	Most Popular Poultry Breeds	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	The student will understand the environmental factors affecting poultry.	Environmental Factors Affecting Poultry Production	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	The student will understand the effect of humidity on poultry.	Humidity	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	The student will understand the effect of ventilation on poultry.	Ventilation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	The student will	Lighting and Density	Presentation,	Oral, written and

		understand the effects of lighting and density on poultry.		explanation, questions and answers, discussion	daily practical tests and scientific reports
10	5	The student will learn the requirements for raising poultry.	Poultry Raising Requirements	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	The student will understand the types of manholes and how to use them.	Drinking Water	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student will understand the ventilation requirements and how to use them.	Ventilation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student will understand the heating requirements and how to use them.	Heating	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student will understand the cooling requirements and how to use them.	Cooling	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student will understand the types of bedding used and the advantages of each.	Bedding	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Poultry farming and care, Dr. Sami Allam
Recommended books and references (scientific journals, reports…)	Textbook of Poultry Production and Management, Dr. Girrag Goyal
Electronic References, Websites	https://aalameldawagen.com/ar/articles

Course Description Form

1. Course Name:	
Forage crops	
2. Course Code:	
ANP 104	
3. Semester / Year:	
2024 - 2025	
4. Description Preparation Date:	
17 – 7 - 2025	
5. Available Attendance Forms:	
Paper form including name, date of attendance and signature	
6. Number of Credit Hours (Total) / Number of Units (Total)	
75/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Muhammad Amin Walid Taha Amin Email: mohmadameenm@ntu.edu.iq	
8. Course Objectives	
Course Objectives	By the end of the course, the student is expected to be able to: 1. Understand the basic concepts of forage crops and pastures 2. Explain the mechanisms by which various environmental and climatic factors and crop service processes affect forage production 3. Identify the types of forage crops 4. Analyze the effects of various service processes on production, both quantitatively

	and qualitatively 5. Understand the relationship between the composition of animal feeds and animal production, both quantitatively and qualitatively 6. Identify each forage crop separately 7. Understand the importance of these forages, their effects, and how to benefit from them

9. Teaching and Learning Strategies

Strategy	There are several effective strategies for teaching forage crops and pastures, which aim to foster a deep understanding of the effects of various plant physiological processes and develop students' critical thinking skills. These include: 1. Dialogue- and discussion-based learning. 2. Brainstorming. 3. Cooperative learning. 4. Simulation-based learning. 5. Practical training. 6. Self-directed learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	1. The student should understand the basic concepts of the importance of livestock. 2. The student should	The importance of livestock, the importance of fodder crops and their role in meeting the fodder needs of livestock, the reality of	Lecture, presentation, illustrations	Questions and answers + exercise solutions

		understand the importance of fodder crops and their role in meeting the fodder needs of livestock. 3. The student should understand the phenomena and implications of the influence of all climatic and service factors on the production of various fodder crops..	fodder crop cultivation in Iraq		
2	3	1. The student will understand the factors affecting fodder production and quality. 2. The student will know how to utilize saline and rain-fed lands for fodder	Factors affecting fodder production and quality, exploitation of saline and rain-fed lands in fodder crop production	Lecture, presentation, illustrations	Questions and answers + exercise solutions

		crop production.			
3	3	1. The student will understand the environmental conditions suitable for Alfalfa production. 2. The student will understand the effects of these conditions on Alfalfa seed production..	(Alfalfa) economic importance, suitable environmental conditions, for the production of alfalfa seeds	Lecture, presentation, illustrations	Questions and answers + exercise solutions
4	3	1. The student will understand the economic importance of alfalfa. 2. The student will understand the various influences on alfalfa seed production.	Alfalfa: economic importance, suitable environmental conditions, seed production	Lecture, presentation, illustrations	Questions and answers + exercise solutions
5	3	1. The student will be able to identify the crops of hartaman, karta, and cocos. 2. The student	Hartaman, Kart, Kakouz economic importance, suitable environmental conditions, seed	Lecture, presentation, illustrations	Questions and answers + exercise solutions

		will understand the different effects on seed production of each of these crops.	production		
6	3	1. The student will be familiar with forage crops. 2. The student will understand the economic importance, suitable environmental conditions, production principles, and uses of these crops.	Production of forage crops (1) Yellow corn (2) White corn) and their economic importance includes suitable environmental conditions, production principles, and their fodder uses.	Lecture, presentation, illustrations	Questions and answers + exercise solutions
7	3	1. The student will be familiar with the economic importance of Sudanese grass, its suitable environmental conditions, production principles, and fodder uses.	Sudanese grass: economic importance, suitable environmental conditions, production principles, fodder uses, species of the genus Sorghum, and the danger of green feed to	Lecture, presentation, illustrations	Questions and answers + exercise solutions

		2. The student will be familiar with the species of the genus Sorghum. 3. The student will understand the dangers of green feed to animals due to hydrocyanic acid (HCN) poisoning.	animals as a result of hydrocyanic acid (HCN) poisoning.		
8	3	1. The student will understand the economic importance of barley, oats, and millet, as well as the basics of production. 2. The student will understand the species used for fodder and their uses for fodder.	Barley, oats, millet: economic importance, production principles, species used for fodder, and their exploitation for fodder.	Lecture, presentation, illustrations	Questions and answers + exercise solutions
9	3	1. The student should know the ingredients of concentrated feed.	Concentrated feed materials, their importance in animal nutrition, their sources, their	Lecture, presentation, illustrations	Questions and answers + exercise solutions

		2. The student should understand their importance in animal nutrition. 3. The student should know their sources and nutritional content (chemical composition).	content of nutritional elements (their chemical composition).		
10	3	1. The student will know the definition of feed mixtures. 2. The student will understand their importance and types. 3. The student will be familiar with the basic elements of feed mixtures.	Feed mixtures, definition, importance, types, basic elements included in the feed mixture.	Lecture, presentation, illustrations	Questions and answers + exercise solutions
11	3	1. The student will understand what threshing is, its definition, and its importance in animal nutrition.	Threshing, definition, its importance in animal nutrition, why do we resort to threshing, determining the	Lecture, presentation, illustrations	Questions and answers + exercise solutions

		2. The student will understand determining the appropriate time for cutting based on growth stages, drying methods, and the types of forage loss that occur during threshing.	appropriate time for cutting according to the growth stages, drying methods, types of loss of feed material that occurs during threshing.		
12	3	1. The student will know: silage, its definition, the importance of its production, and the manufacturing steps. 2. The student will know how to identify the cutting stages, the chemical changes in fodder during preservation, and methods for preserving silage. 3. The student will know the	Silage, its definition, the importance of its manufacture, manufacturing steps, determining the cutting stages, chemical changes in the feed during preservation, methods of preserving silage, preservatives, types of loss in nutritional value resulting from preservation.	Lecture, presentation, illustrations	Questions and answers + exercise solutions

		techniques used in preservatives and the types of loss in nutritional value resulting from preservation.			
13	3	1. The student should know: What are pastures? 2. The student should know the definition and importance of pastures. 3. The student should know the types of pastures.	Pastures, definition, importance, types	Lecture, presentation, illustrations	Questions and answers + exercise solutions
14	3	1. The student will understand the basics of quantitative evaluation of pasture plants. 2. The student will understand the benefits of identifying these basics. 3. The student will understand	Fundamentals of quantitative evaluation of pasture plants, determining pasture productivity	Lecture, presentation, illustrations	Questions and answers + exercise solutions

		the benefits of determining pasture productivity.			
15	3	1. The student will identify the causes of the deterioration of natural pastures. 2. The student will understand methods for improving natural pastures and how to preserve them.	Causes of deterioration of natural pastures, methods of improving natural pastures and how to preserve them.		

11. Course Evaluation :

1 – Weekly Preparation ---------- 5%

2 – Weekly Tests ---------- 5%

3 – Monthly Written Tests ---------- 70%

4 – Reports ---------- 5%

5 – Discussions ---------- 5%

6 – Attendance ---------- 5%

7 – Asking Questions ---------- 5%

Total ---------- 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	The vocabulary prescribed by the Ministry of Higher Education and Scientific Research

Main references (sources)	Al-Ani, Tariq Ali and Mr. Irfan Muhammad Arshad (1983). Production of fodder crops and pastures. Technical Institutes Foundation. Al-Tikriti, Ramadan Ahmed Al-Tayef and Tawakkul Younis Rizq and Hikmat Askar Al-Rumi (1981). Fodder crops and pastures. Dar Al-Kutub Foundation for Printing and Publishing, University of Mosul. Mayouf, Mahmoud Ahmed and Abdullah Qasim Al-Fakhri (1982). Introduction to legumes in Iraq. Abdullah, Ghazi Mahmoud (1976). Some methods used in studies of natural pastures. Ministry of Agriculture and Agrarian Reform, Directorate of Natural Pastures, Department of Agricultural Affairs, Bulletin No.
Recommended books and references (scientific journals, reports...)	Google scholar, researcher gate
Electronic References, Websites	All sites that provide reliable sources and also artificial intelligence tools

Course Description Form

1. Course Name:
Sheep and goat production techniques
2. Course Code:
ANP 105
3. Semester / Year:
Semester 1 / Year 1
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
200 hr. / 8 Units
7. Course administrator's name (mention all, if more than one name)
Name: Waseem Amer Hashem Email: wasseem_amer@ntu.edu.iq
8. Course Objectives
Course Objectives • **1. Apply theories and concepts related to sheep and goat production to practical practice.** • **2. Be able to analyze and evaluate production systems to improve efficiency and quality.** • **3. Use modern technologies to improve sheep productivity and quality.** • **4. Be able to care for and treat animals.** • **5. Enhance students' understanding of the importance of applying animal welfare standards and how to implement them in animal production.**
9. Teaching and Learning Strategies
Strategy 1. Project-based learning: Students develop an applied project, such as designing a sheep farm management plan or evaluating a goat feeding system. 2. Active learning: This includes class discussions, analysis of real-life cases (such as fertility problems or diseases in the herd), and group activities. 3. Motivated micro-lessons: Divide the content into short units and use video presentations or field photos.

4. Field visits and virtual simulations: Visit sheep and goat farms or use virtual reality technologies to observe breeding and care practices.
5. Brainstorming and problem-solving: Present a real-life production problem, such as "low growth rate in a particular herd," and encourage students to propose scientific solutions.
6. Collaborative learning: Divide students into groups to design a plan to improve herd fertility or develop a feeding protocol.
7. Integrating e-learning and digital resources: Provide recorded lectures, explanatory videos, and scientific articles for analysis.
8. Guided discussions on animal values and behavior: such as discussing the ethics of sheep farming or animal welfare in production techniques.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theoretical + 3 practical	Acquire knowledge and skills	The economic importance of sheep and goat production	Introductory lecture and discussions about the curriculum	Homework
2	2 theoretical + 3 practical	Introduces students to the different types of sheep and goats	Sheep and goat breeds and their classification methods	Presentation, explanation, questions and answers, discussion	Quiz Exam
3	2 theoretical + 3 practical	The most important difficulties facing sheep farming	Reproduction	Presentation, explanation, questions and answers, discussion	Report
4	2 theoretical + 3 practical	Crossbreeding methods and production of high-yielding strains	sexual maturity	Presentation, explanation, questions and answers, discussion	Quiz Exam
5	2 theoretical + 3 practical	Ovulation rate and factors affecting it	Ways to improve and increase reproductive performance Fetal death	Presentation, explanation, questions and answers, discussion	Oral Questions and Answers
6	2 theoretical + 3 practical	Preparing females for birth	Female behavior at birth: death at birth death until	Presentation, explanation, questions and answers, discussion	Homework

			weaning		
7	2 theoretical + 3 practical	Sheep and goat nutrition	Nutritional Habits Female and Male Nutrition	Presentation, explanation, questions and answers, discussion	Homework
8	2 theoretical + 3 practical	monthly exam 1			
9	2 theoretical + 3 practical	Feeding lambs and kids	Feeding Methods for Young Animals Weaning and Breastfeeding Systems	Presentation, explanation, questions and answers, discussion	Report
10	2 theoretical + 3 practical	Milk production in sheep	The Economic Importance of Sheep Milk Production The Importance of Goat Milk Methods for Measuring Milk Production	Presentation, explanation, questions and answers, discussion	Quiz Exam
11	2 theoretical + 3 practical	Growth, development and meat production	Postnatal Growth and Development Methods of Measuring Growth	Presentation, explanation, questions and answers, discussion	Oral Questions and Answers
12	2 theoretical + 3 practical	Wool and hair production	Characteristics of wool fibers Density and percentage of sacs Characteristic s of Iraqi wool	Presentation, explanation, questions and answers, discussion	Homework
13	2 theoretical + 3 practical	monthly exam 2			
14	2 theoretical + 3 practical	Improving the productive qualities of sheep	Cell and Genetics Quantitative Traits Genetic Equivalence	Introductory lecture and discussions about the curriculum	Report
15	2 theoretical + 3 practical	Improving productive qualities	Genetic Improvement Methods Biotechnology in Animal	Presentation, explanation, questions and answers, discussion	Quiz Exam

			Breeding and Genetics		

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Sheep and Goat Production Book**
Main references (sources)	**Al-Jalili Fakhri Zuhair**
Recommended books and references (scientific journals, reports…)	**Sheep and Goat Production Handbook.pdf**
Electronic References, Websites	**https://www.boerboksa.co.za/Publications/Articles/New/Sheep%20and%20Goat%20Production%20Handbook.pdf**

Course Description Form

1. Course Name:
Principles of animal production
2. Course Code:
ANP151
3. Semester / Year:
Semester 2 / Year 1
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hr. \ 5Units
7. Course administrator's name (mention all, if more than one name)
Name: harith nafi shuker Email: harithalmansour@ntu.edu.iq
8. Course Objectives
Objectives **1. – Introduce students to the basic concepts and terminology in animal production scienc** **2. – Explain the anatomical structure and basic physiological functions of the most import productive animals (cattle, sheep, goats, poultry, pigs, camels, rabbits, bees, and fish).** **3. – Understand the principles of animal genetics and reproduction and their relationship improving production traits.** **4. Master the principles of nutrition and management.** **5. – Introduce students to the different types of feed materials and their nutritio components.** **6. – Explain the basic nutritional needs of animals at various stages of production (grow fattening, gestation, lactation, and egg laying).**
9. Teaching and Learning Strategies
1. Problem-based learning: Using real-life problems to promote criti thinking and learning. 2. Cooperative learning: Encouraging teamwork and collaborati among students. 3. Field visits: Organizing field visits to health or veterinary centers.

4. Self-directed learning: Encouraging students to engage independent learning and research.
5. Project-based learning: Encouraging students to work on resear projects.
6. Learning through Discussion: Encourage students to participate discussions and debates.
7. Continuous Assessment: Conduct ongoing assessments throughc the semester.
8. Self-Assessment: Encourage students to evaluate their performar and identify areas for improvement.
9. Additional Resources: Provide additional resources such as boc and electronic references.
10. Summative Assessment: Conduct a final assessment at the end the semester.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Not knowing the principles of animal production	The economic importance of sheep, the advantages of sheep farming, the origin of sheep, and methods of dividing sheep.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student should learn about sheep breeds.	Global sheep breeds, Iraqi sheep	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will be able to establish the herd.	Establishing a sheep flock, choosing the breed, flock size, when to buy sheep	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student demonstrates knowledge by being able to describe (brood preparation, hormone injection, egg collection, fertilization, hatching)	The student demonstrates knowledge of the ability to identify reproductive timing and age of puberty.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
5	5	The student knows the dates of pregnancy and birth in lambs.	Pregnancy, birth, care and raising of lambs	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	Student knowledge of feeding schedules	Sheep feeding	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	The student should have the ability to produce meat and fatten lambs.	Meat production, growth and development in sheep, fattening lambs, meat	Presentation, explanation, questions and answers,	Oral, written and daily practical tests and scientific reports

			cutting	discussion	
8	5	The student should know the milk production processes.	Milk production, milk production process and methods of measuring it, structure and physiology of the mammary gland	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	The student should have information about wool production.	Wool production, properties and characteristics of wool, growth of wool fibers	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	Students learn the composition and arrangement of wool.	Wool composition, wool grades and ranks, some general characteristics of wool	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	Students were able to apply genetic improvement.	Genetic improvement of sheep, improvement methods, improvement of Iraqi sheep	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student should be able to develop a health care program.	Sheep health care	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student learns from knowing the importance of goats.	The economic importance of goats, the origin of goats, and goat breeds	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	Iraqi goats are distinguished by their milk and hair production.	Iraqi goats, goat reproduction, milk production, hair and skin in goats	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student is able to produce a condenser for lambs.	Inheritance and selection of mothers	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Principles of animal production
Main references (sources)	• Animal and Poultry Nutrition Dr. Nabil Abdel Fattah Kamel
Recommended books and references (scientific journals, reports…)	Fundamentals of Animal Production, Dr. Abdel Moneim Hegazy
Electronic References, Websites	**Sheep and Goat Science (R. Wild 2021)**

Course Description Form

1. Course Name:
Laboratories techniques
2. Course Code:
ANP 152
3. Semester / Year:
Semester 6 / Year 3
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
150 hr. \ 6 Units
7. Course administrator's name (mention all, if more than one name)
Name: Yahya Natiq Mohammed Email: yahyanatiq2003@ntu.edu.iq
8. Course Objectives
1. Understanding Laboratory Medicine: Studying the importance of laboratory diagnosis of diseases that can affect animals. **2. Identifying the Parts of a Laboratory: Identifying the types, types, and specialties of laboratory equipment.** **3. Studying Pathogens: Understanding the basics of disease diagnosis.** **4. Methods of Collecting Pathological Samples: Studying the methods of collecting, stori and transporting samples to the laboratory.** **5. Understand how a spectrophotometer works.** **6. Understand how a centrifuge and a distillation device work.** **7. Occupational safety and prevention in laboratories.** **8. Study modern techniques used in laboratory diagnostics.**
9. Teaching and Learning Strategies
1. Problem-based learning: Using real-life problems to promote criti thinking and learning. 2. Cooperative learning: Encouraging teamwork and collaborati among students. 3. Field visits: Organizing field visits to health or veterinary centers.

4. Self-directed learning: Encouraging students to engage independent learning and research.
5. Project-based learning: Encouraging students to work on resear projects.
6. Learning through Discussion: Encourage students to participate discussions and debates.
7. Continuous Assessment: Conduct ongoing assessments throughc the semester.
8. Self-Assessment: Encourage students to evaluate their performar and identify areas for improvement.
9. Additional Resources: Provide additional resources such as boc and electronic references.
10. Summative Assessment: Conduct a final assessment at the end the semester.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student learns about laboratory medicine and its importance in diagnosing animal diseases.	Introduction: Definition of laboratory medicine and its importance in diagnosing animal diseases.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student learns about the types of samples.	Laboratory samples: Types of samples.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student learns about the methods of collecting pathological samples.	Methods of collecting pathological samples.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student learns about the methods of preserving and transporting laboratory samples.	Storage, preservation, and transportation of laboratory samples.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
5	5	The student learns about the most important chemicals used in laboratories.	Chemicals used in laboratories.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	Occupational Safety in Medical Laboratories	The student learns about occupational safety principles.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	Centrifuge	The student learns about the	Presentation,	Oral, written and

			operation of a centrifuge.	explanation, questions and answers, discussion	daily practical tests and scientific reports
8	5	Distillation Device	The student learns about the operation of a distillation device.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	Spectrophotometer	The student learns about the operation of a spectrophotometer.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	Incubator and electric oven	The student learns how an incubator and an electric oven work.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	Autoclave: Sterilizing materials	The student learns how an autoclave works: sterilizing materials.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	Exam	A written test is taken to assess student progress.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	Blood tests: Hb, PCV	The student learns about blood tests.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	Blood tests: Red and white blood cell counts, and platelets	The student learns about cellular blood tests.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	Advanced modern technologies for disease diagnosis: PCR, ELISA	The student learns about some advanced modern techniques for diagnosing diseases.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books any)	No curricular books
Main references (sources)	OIE. (2006). Manual of Diagnostic Tests and Vaccines for Terrestrial Animals. : http://www.oie.int
Recommended books and references (scientific journals, reports…)	Coles, E. H. (1986). Veterinary clinical pathology. 4th ,ed., WB Saunders Co Philadelphia, London .Toronto
Electronic References, Websites	https://www.youtube.com/shorts/C68hlabh9c

Course Description Form

1. Course name:	
English language (2)	
2. Course code:	
NTU200	
3. the chapterAcademic/ year	
4. Description preparation date	
17\7\2025	
5. Available attendance forms	
1. Weekly lesson schedule (theoretical)). 2. Discussions, scientific seminars, and other extracurricular activities	
6. Number of credit hours (total) / Number of units (total)	
30Hour (2 theoretical) * 15 weeks	
7. Course Supervisor Name (List all names, if there is more than one)	
the name:M.M. Omar Ahmed Fathy e-mail: omar.ah.f@ntu.edu.iq	
8. Course objectives	
1. The student should be able to identify all English language skills and knowledge. 2. The student should be able to encourage and develop scientific research in the fields of the English language in general. 3. The student should have the ability to cooperate with local and international organizations in the field of English language development.	**Goals**
9. Teaching and learning strategies	
1. Interactive lectures. 2. Brainstorming. 3. Dialogue and discussion. 4. Assign tasks and report. 5. Assign teamwork to reveal leadership skills.	**Strategy**
10. Course structure	

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	watches	week
Short exams, homework assignments, discussions	Discussion method, lecture method	**Speech parts, sentences in English, comprehension**	Parts of speech, sentence and phrase in English, comprehension	2 theoretic	the first the second
Short exams, homework assignments, discussions	Discussion method, lecture method	**Proper, common, material, collective, abstract, countable and uncountable nouns, a, an, the.**	The student should be able to recognize proper nouns, indefinite nouns, material nouns, plural nouns, moral nouns, countable and uncountable nouns, definite and indefinite articles.	2 theoretic	the third
Short exams, homework assignments, discuss	Discussion method, lecture method	**Pronouns: types, personal (subject, objective), possessive, reflexive, demonstrative, interrogative, and relative pronouns.**	The student should be able to identify pronouns and their types: personal, accusative, genitive, possessive, reflexive, demonstrative, relative	2 theoretic	Fourth + Fifth

ions			pronouns, and interrogative pronouns.		
Short exams, homework assignments, discussions	Discussion method, lecture method	**Auxiliary verbs, types**	The student should be able to identify auxiliary verbs and their types.	2 theoretic	Sixth
Short exams, homework assignments, discussions	Discussion method, lecture method	**Tenses in active voice case: simple tense: present, past, future**	The student should be able to identify the tenses in the active voice: simple tense: present, past, future.	2 theoretic	Seventh
Short exams,	Discussion method, lecture method	**Continuous tense: present, past, future**	The student should be able to know the continuous	2 theoretic	The eighth

homework assignments, discussions			tense: present, past, and future.		
Short exams, homework assignments, discussions	Discussion method, lecture method	**Perfect tense: present, past, future**	The student should be able to know the perfect tense: present, past, and continuous.	2 theoretic	Ninth
Short exams, homework assignments, discussions	Discussion method, lecture method	**Continuous perfect tense: present, past, future**	The student should be able to know Perfect Continuous Tense: Present, Past, Future	2 theoretic	tenth

Short exams, homework assignments, discussions	Discussion method, lecture method	**Adjectives: names, possessive, descriptive, long, and short adjective. Comparison and similarity**	The student should be able to know Adjectives: proper nouns, possessive adjectives, descriptive adjectives, long adjectives, short adjectives, comparative adjectives and similes	2 theoretic	eleventh + twelfth
Short exams, homework assignments, discussions	Discussion method, lecture method	**English sounds: constants, vowels**	The student should be able to identify the sounds in the English language: consonants, vowels.	2 theoretic	thirteenth + fourteenth
Short exams, homework assignments, discussions	Discussion method, lecture method	**Review of the article**	A comprehensive review of all the material's vocabulary	2 theoretic	fifteenth
11. Course Evaluation					

((Oral exams / Written exams / Weekly reports / Daily attendance / Participation and interaction in lectures / Midterm and final exams))	
12. Learning and Teaching Resources	
Rapid Rewiw	**Required textbooks (curriculum books, if available)**
English Grammar	**Main References (Sources)**
Eurasea Article	**Recommended books and references (scientific journals, reports...)**
Lib.gin	**Electronic references and websites**

Course Description Form

1. Course name:	
Computer Principles (2)	
2. Course code:	
NTU201	
3. the chapterAcademic/ year	
First semester	
4. Description preparation date	
17\7\2025	
5. Available attendance forms	
1. Weekly lesson schedule (theoretical) And my work). 2. Discussions, scientific seminars, and other extracurricular activities	
6. Number of credit hours (total) / Number of units (total)	
30Hour (1 theoretical + 1 practical) * 15 weeks	
7. Course Supervisor Name (List all names, if there is more than one)	
the name:M.M. Manhal Mohammed Bashir e-mail: manhalbasher@ntu.edu.iq	
8. Course objectives	
1. The student must be able to:Introduction to the Calculator - Generations of the Calculator - Hardware and Software Components 2. The student should be able to identifyWith the most important basic information about computers, computer generations, and operating systems. 3. The student should be able to know:Operating systemMS-Dos, system concept, system flag, disks, directories and their levels, files, internal and external commands.	**Goals**
9. Teaching and learning strategies	
1. Interactive lectures. 2. Brainstorming. 3. Practical training. 4. Dialogue and discussion. 5. Assign tasks and report. 6. Assign teamwork to reveal leadership skills.	**Strategy**
10. Course structure	

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	watches	week
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Introduction to computer Basic Concepts in Information Technology computer system information technology Types of computers computer parts Input and output units memory CPU	The importance of computers in our daily and economic lives Knowledge of information technology and learning the parts and units of a computer	1 theoretical 1 practic	the firs
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Equipment Computer and logic units Recorders control unit Input unit units of tax Memory, Storage, and Performance Main memory types	Learn about computer hardware and memory types	1 theoretical 1 practic	the second
Short exams, homework assignments,	theoretical:Auditory methods: writing on the board method, direct dialogue method	Data representation in memory Memory unit Secondary memory and its types storing data in memory Computer performance Software	Learn how to represent data, what units of measurement are, learn about software and translators, and learn about types of operating	1 theoretical 1 practic	the thi

discussions	practical:Assignment and report	Systems software (programming languages) Translations, Interpreters, Operating Systems Types of operating systems Application software	systems.		
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Theoretical exam (1)	Exam on the subject	1 theoretical 1 practic	Fourth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Windows (windows) Use the mouse, minimize and maximize windows, close windows	Getting to know Windows	1 theoretical 1 practic	Fifth
Short exams,	theoretical:Auditory methods:	Move windows from one place to another, control	Learn about moving windows and	1 theoretical	Sixth

homework assignments, discussions	writing on the board method, direct dialogue method practical:Assignment and report	window size, taskbar, date and time	how to control them.	1 practic	
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Start keyStart Menu Programs Programs My documentsMy Document	Learn about the main Windows icons	1 theoretical 1 practic	Sevent
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Desktop Create a shortcut icon for an application or file Recycle Bin Windows Explorer Formatting floppy disks	Learn about non-essential shortcut icons	1 theoretical 1 practic	The eighth
Short exams,	theoretical :Auditory methods:	File arrangement Select, select folder, create	Identify the operations performed on	1 theoretical	Ninth

homework assignments, discussions	writing on the board method, direct dialogue method practical:Assignment and report	folder, rename, delete file, copy file, move file	the file	1 practic	
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Screen settings Stop screen Change mouse pointer Mouse speed control Double-click speed control	Screen and mouse settings explained	1 theoretical 1 practic	tenth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Software Installation and Uninstallation Disk Information, Request Help	Knowing how to install and remove programs from your hard drive	1 theoretical 1 practic	eleventh
Short exams,	theoretical:Auditory methods:	Monthly exam (2)	Exam on the subject	1 theoretical	twelfth

homework assignments, discussions	writing on the board method, direct dialogue method practical:Assignment and report			1 practic	
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Calculator / Notebook / Notebook / Use the notebook to edit and create the file Painter / Screen Components	Knowledge and practical application	1 theoretical 1 practic	thirteenth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method practical:Assignment and report	Create drawings / Specify foreground and background colors / Choose brush stroke size / Select and select the drawing tool / Save the drawing / Make the drawing a desktop background / Finish the drawing Entertainment programs Media player	Learn how to create and manage graphics.	1 theoretical 1 practic	fourteenth
Short	theoretical:Auditory	Viruses / Reason for the name / Definition /	Learn about types of viruses	1 theoretical	fifteent

exams, homework assignments, discussions	methods: writing on the board method, direct dialogue method practical:Assignment and report	Methods of virus spread / Symptoms of virus infection / Methods of protection / Types of viruses Computer crimes / Theft / Hackers	and ways to protect against them	1 practic	

11. Course Evaluation	
((Oral exams / Written exams / Weekly reports / Daily attendance / Participation and interaction in lectures / Midterm and final exams))	
12. Learning and Teaching Resources	
Metzeelaer and Scharpf/Benjamin/Cummings Pub. 1995	**Required textbooks (curriculum books, if available)**
Library, scientific websites on the Internet, viewing lectures from other universities	**Main References (Sources)**
Internet	**Recommended books and references (scientific journals, reports...)**
	Electronic references and websites

Course Description Form

1. Course name:	
Baath regime crimes in Iraq	
2. Course code:	
NTU203	
3. the chapterAcademic/ year	
First semester	
4. Description preparation date	
17\7\2025	
5. Available attendance forms	
1. Weekly lesson schedule (theoretical) And my work). 2. Discussions, scientific seminars, and other extracurricular activities	
6. Number of credit hours (total) / Number of units (total)	
30Hour (2 theoretical) * 15 weeks	
7. Course Supervisor Name (List all names, if there is more than one)	
the name:Dr. Ahmed Faris Al-Sawaf e-mail: ahmedalsawaf@ntu.edu.iq	
8. Course objectives	
1. The student must be able to understand and comprehend.theBasic concepts related to the definition of crimes, their types and divisions. 2. The student must be able to:Defining the crimes and violations of the former regime and the types of international crimes 3. The student must be able to:Defining mass grave crimes and violations of Iraqi laws 4. The student must be able to:Addressing environmental crimes, the destruction of cities, demographic change policies, and extrajudicial detention.	**Goals**
9. Teaching and learning strategies	
1. Interactive lectures. 2. Brainstorming. 3. Dialogue and discussion. 4. Assign tasks and report. 5. Assign teamwork to reveal leadership skills.	**Strategy**

10. Course structure					
Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	watches	week
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: - Crimes of the Ba'ath regime according to the Iraqi High Criminal Court Law of 2005 - The concept of crimes and their types - Definition of crime in language and terminology	theoretical: The student should be familiar with the concept of crimes and their types.	2 theoretical	the firs
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: - Crime sections - Crimes of the Ba'ath regime as documented by the Iraqi Supreme Criminal Court Law of 2005	theoretical: The student should be able to identify the crimes of the Baath regime according to the Criminal Court.	2 theoretical	the second
Short exams, homework assign	theoretical :Auditory methods: writing on the board method, direct dialogue	theoretical: - Types of international crimes - DecisionsIssuedFrom the Supreme Criminal Court	theoretical: The student should be able to identify the types of international crimes.	2 theoretical	the thi

ments, discussions	method				
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: - Psychological and social crimes and their effects. - Psychological crimes - Mechanisms of psychological crimes Psychological effects of crimes	theoretical: The student should be able to distinguish between psychological and social crimes.	2 theoretical	Fourth
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: - Social crimes - Militarization of society The Baath regime's position on religion	theoretical: The student should be able to identify social crimes and the Baath regime's position on religion.	2 theoretical	Fifth
Short exams, homework assignments,	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: - Violations of Iraqi laws Images of human rights violations and crimes of power	theoretical: The student should be able to identify violations of Iraqi laws and their forms.	2 theoretical	Sixth

discussions					
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: Some decisions on the political and military violations of the Baath regime	theoretical: The student should be able to identify political and military violations.	2 theoretical	Sevent
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: Baath regime prisons and detention centers	theoretical: The student should be able to identify prison and detention centers.	2 theoretical	The eighth
Short exams, homework assignments, discuss	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: Environmental crimes of the systemResurrection In Iraq	theoretical: The student should be able to identify the environmental crimes of the Baath regime.	2 theoretical	Ninth

ions					
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: War pollution, radioactivity, and mine explosions	theoretical: The student should be able to understand war pollution and mine explosions.	2 theoretical	tenth
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: – Destruction of cities and villages scorched earth policy	theoretical: The student should be able to identify the scorched earth policy.	2 theoretical	eleventh
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: – draining the marshes Bulldozing palm groves, trees and crops	theoretical: The student should be able to identify how to clear palm groves.	2 theoretical	twelfth

Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: - Mass grave crimes - theTMass graves corporal	theoretical: The student should be able to identify mass graves.	2 theoretical	thirteenth
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: Mass graves and genocide committed by the Baath regime	theoretical: The student should be able to identify the mass graves committed by the Baath regime.	2 theoretical	fourteenth
Short exams, homework assignments, discussions	theoretical :Auditory methods: writing on the board method, direct dialogue method	theoretical: Chronological classification of genocide graves in Iraq	My theory: The student should be able to chronologically classify genocide graves.	2 theoretical	fifteent
11. Course Evaluation					

((Oral exams / Written exams / Weekly reports / Daily attendance / Participation and interaction in lectures / Midterm and final exams))	
12. Learning and Teaching Resources	
	Required textbooks (curriculum books, if available)
Private publicationsCrimes and Penal Codeand available human rightsinCollege Library and University Central Library	**Main References (Sources)**
	Recommended books and references (scientific journals, reports...)
Human rights websites.	**Electronic references and websites**

Course Description Form

1. Course name:	
Professional ethics	
2. Course code:	
NTU204	
3. the chapter Academic/ year	
First semester	
4. Description preparation date	
17\7\2025	
5. Available attendance forms	
1. Weekly lesson schedule (theoretical). 2. Discussions, scientific seminars, and other extracurricular activities	
6. Number of credit hours (total) / Number of units (total)	
7. Course Supervisor Name (List all names, if there is more than one)	
the name:Dr. Ahmed Fares Al-Sawaf e-mail: ahmedalsawaf@ntu.edu.iq	
8. Course objectives	
1. Introducing students to the concepts of occupational safety and health and their importance in protecting people, property, and the environment.. 2. Identify the types of hazards (electrical, mechanical, chemical, physical, biological, etc.) and ways to prevent them.. Providing students with knowledge of local and international regulations and laws related to occupational safety and health..	**Goals**
9. Teaching and learning strategies	
1. Interactive lectures. 2. Brainstorming. 3. Dialogue and discussion. 4. Assign tasks and report. 5. Assign teamwork to reveal leadership skills.	**Strategy**
10. Course structure	

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	watches	week
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method	theoretical: Ethics and Law	theoretical: The student should be able to define ethics and law.	2 theoretical	the firs
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method	theoretical: Ethics and moral analysis	theoretical: The student should be able to define ethics and ethical analysis.	2 theoretical	the second
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method	theoretical: Ethics and professions	theoretical: The student should be able to defineEthics and professions	2 theoretical	the thi

Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method	theoretical: Anonymity, security, privacy, and civil liberties	theoretical: The student should be able to identify privacy and civil liberties.	2 theoretical	Fourth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method	theoretical: Intellectual Property Rights and Computer Technology	theoretical: The student should be able to identify intellectual property rights and computer technology.	2 theoretical	Fifth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method	theoretical: The concept of cybercrime and the corresponding Iraqi law	theoretical: The student should be able to defineThe concept of cybercrime and Iraqi law	2 theoretical	Sixth
Short exams,	theoretical:Auditory methods: writing on	theoretical: Types of attacks on computer systems	theoretical: The student should be able to identify types	2 theoretical	Sevent

homework assignments, discussions	the board method, direct dialogue method		of attacks on computer systems.		
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method	theoretical: exam	theoretical: exam	2 theoretical	The eighth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method	theoretical: Motives of computer crimes	theoretical: The student should be able to identify the motives behind computer crimes.	2 theoretical	Ninth
Short exams, homework assign	theoretical:Auditory methods: writing on the board method, direct	theoretical: Social costs and consequences	theoretical: The student should be able to identify the social costs and consequences.	2 theoretical	tenth

ments, discuss ions	dialogue method				
Short exams, homew ork assign ments, discuss ions	theoretical:A uditory methods: writing on the board method, direct dialogue method practical:As signment and report	theoretical: Computer Crime Prevention Strategies	theoretical: The student should be able to understand computer crime prevention strategies.	2 theoreti cal 3 practic	eleven th
Short exams, homew ork assign ments, discuss ions	theoretical:A uditory methods: writing on the board method, direct dialogue method	theoretical: Iraqi Cybercrime Law	theoretical: The student should be able to defineElectroni c Crimes Law	2 theoreti cal 3 practic	twelfth
Short exams, homew ork assign ments, discuss	theoretical:A uditory methods: writing on the board method, direct dialogue method	theoretical: The concept of cybercrime and the corresponding Iraqi law	theoretical: The student should be able to define The concept of cybercrime and the corresponding Iraqi law	2 theoreti cal	thirtee nth

ions					
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method	theoretical: Social costs and consequences	theoretical: The student should be able to define Social costs and consequences	2 theoretical	fourteenth
Short exams, homework assignments, discussions	theoretical:Auditory methods: writing on the board method, direct dialogue method	theoretical:Motives of computer crimes	theoretical: The student should be able to define Motives of computer crimes	2 theoretical	fifteent

11. Course Evaluation
((Oral exams / Written exams / Weekly reports / Daily attendance / Participation and interaction in lectures / Midterm and final exams))

12. Learning and Teaching Resources	
	Required textbooks (curriculum books, if available)
	Main References (Sources)

	Recommended books and references (scientific journals, reports...)
	Electronic references and websites

Course Description Form

1. Course Name:
Summer Cereal and Legume Crops
2. Course Code:
TAMO 201
3. Semester / Year:
2024 – 2025
4. Description Preparation Date:
17/ 7 / 2025
5. Available Attendance Forms:
Paper form including name, date of attendance and signature
6. Number of Credit Hours (Total) / Number of Units (Total)
60 / 5
7. Course administrator's name (mention all, if more than one name)
Name:Dr. Shihhab ahmed Email:
8. Course Objectives

Course Objectives	At the end of the course, the student is expected to be able to: - **Identify summer field crops** - **Understand the importance of summer cereal crops** - **Differentiate between cereal and legume crops** - **Understand crop management methods** - **Know the types of fertilizers and methods of their application**

9. Teaching and Learning Strategies

Strategy	- Discussion-based learning - Brainstorming - Asking questions and trying to answer them through cooperation Self-learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Recognize the importance and history of organic chemistry. Differentiate between ionic and covalent bonds. Explain the concept of hybridization (sp3, sp2, sp) and draw simple molecular shapes	Introduction to Organic Chemistry and Chemical Bonding (Ionic and Covalent Bonds, sp3 Hybridization).	Lecture, presentation, illustrations	Short answer questions on specific topics
2	5	Name alkanes and cycloalkanes using IUPAC rules. Relate the molecular structure of alkanes to their physical properties (e.g., boiling point	Alkanes and Cycloalkanes: IUPAC Nomenclature and Physical Properties	Lecture, presentation, illustrations	Questions and answers
3	5	Draw Newman projections to illustrate different	Conformations of Alkanes and Cycloalkanes	Lecture, presentation,	Questions and answers

		conformations. Analyze the stability of different cycloalkane conformations (chair and boat	(Newman Projections, Chair and Boat Conformations).	illustrations	
4	5	Name alkenes and alkynes and determine the degree of unsaturation. Describe the double and triple bonds in terms of hybridization (sp2, sp)	Alkenes and Alkynes: Structure, Nomenclature, and Physical Properties	Lecture, presentation, illustrations	Questions and answers
5	5	Explain the mechanism of an electrophilic addition reaction. Apply Markovnikov's rule to predict the major product of a reaction	Electrophilic Addition Reactions of Alkenes and Alkynes (Markovnikov's Rule)	Lecture, presentation, illustrations	Questions and answers + exercise solutions
6	5	Identify chiral centers in a molecule. Distinguish between enantiomers and diastereomers. Assign the absolute configuration (R/S)	Stereochemistry: Chirality, Enantiomers, and Assigning Configuration (R/S)	Lecture, presentation, illustrations	Questions and answers

		to a chiral center			
7	5	Classify alkyl halides as primary, secondary, or tertiary. Name alkyl halides according to the IUPAC system	lkyl Halides: Classification, Nomenclature, and Physical Properties	Lecture, presentation, illustrations	Questions and answers
8	5	Compare the SN1 and SN2 mechanisms. Identify the factors that favor one mechanism over the other (nature of the alkyl halide, nucleophile, solvent	Nucleophilic Substitution Reactions (SN1 & SN2): Mechanisms and Influencing Factors	Lecture, presentation, illustrations	Questions and answers
9	5	Compare the E1 and E2 mechanisms. Apply Zaitsev's rule to predict the most stable elimination product	Elimination Reactions (E1 & E2): Mechanisms and Zaitsev's Rule	Lecture, presentation, illustrations	Questions and answers + exercise solutions
10	5	Name and classify alcohols and ethers. Explain the effect of hydrogen bonding on the physical properties of alcohols	Alcohols and Ethers: Nomenclature, Properties, and Preparation Methods	Lecture, presentation, illustrations	Questions and answers + exercise solutions

11	5	Describe the oxidation reactions of alcohols. Explain the reaction for converting alcohols to alkyl halides	Reactions of Alcohols and Ethers	Lecture, presentation, illustrations	Questions and answers + exercise solutions
12	5	Define the concept of aromaticity and apply Hückel's rule. Name monosubstituted and disubstituted benzene derivatives	Aromatic Compounds: The Concept of Aromaticity, Nomenclature of Benzene Derivatives	Lecture, presentation, illustrations	Questions and answers
13	5	Explain the general mechanism of an EAS reaction. Predict the products of nitration, halogenation, and sulfonation of benzene	Electrophilic Aromatic Substitution (EAS): Nitration, Halogenation, Sulfonation	Lecture, presentation, illustrations	Questions and answers
14	5	Name aldehydes and ketones. Explain the mechanism of nucleophilic addition to the	Aldehydes and Ketones: Structure, Nomenclature, and Nucleophilic Addition Reactions	Lecture, presentation, illustrations	Questions and answers

		carbonyl group			
15	5	Explain the reason for the acidity of carboxylic acids. Recognize the basic reactions of carboxylic acids, such as ester formation	Carboxylic Acids and Their Derivatives: Acidic Properties and Reactions	Lecture, presentation, illustrations	Questions and answers

11. Course Evaluation

- **Continuous Assessment**: Regular quizzes, field reports, and participation in practice al sessions
- **Final Examination:** Written exam assessing both theoretical understanding and the application of practices

Final Project: A comprehensive project where students design a conservation agriculture plan based on a case study

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Required Textbooks (Curriculum books, if any(**
Recommended books and references (scientific journals, reports…)	**Google Scholar, Scientific Researcher Portal**
Electronic References, Websites	**All sites that provide accredited sources and also artificial intelligence tools**

Course Description Form

1. Course Name:
Agricultural Statistics
2. Course Code:
ANP202
3. Semester / Year:
autumn
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
In-person attendance in the classroom
6. Number of Credit Hours (Total) / Number of Units (Total)
٦٠
7. Course administrator's name (mention all, if more than one name)
Name: Doaa Qasim Sabri Email: dqasm0478@ntu.edu.iq
8. Course Objectives

Course Objectives	To equip students with the essential knowledge and skills in applying statistical methods to agricultural data, thereby enhancing the quality of analysis and decision-making across various agricultural fields." According to the curriculum description for the course "Agricultural Biostatistics" (Course Code: 613 Qasr), offered by the Department of Agricultural Economics, College of Science, King Saud University, the general objectives of the course are as follows: 1. **Understanding statistical concepts and terminology:** Study fundamental concepts and terms related to statistics, establishing a strong foundational knowledge base for students in this field. 2. **Analyzing relationships among variables:** Explore different types of relationships between variables—such as correlation and simple linear regression—to understand how variables affect one another.

	3. **Designing regression models:** Learn how to construct simple and multiple linear regression models to study the relationship between a dependent variable and a set of independent variables, and interpret the statistical significance of the coefficients. 4. **Addressing regression issues:** Gain the ability to identify practical regression problems and apply remedies to ensure the accuracy of results. 5. **Using general linear models:** Become familiar with general linear models—such as analysis of variance (ANOVA) and analysis of covariance (ANCOVA)—and apply them in agricultural studies. 6. **Exploring advanced regression models:** Study certain types of advanced regression models—such as logistic regression and Poisson regression—and apply them to the analysis of agricultural data.

9. Teaching and Learning Strategies

Strategy	**1. Active Learning & Problem-Based Learning** • **Focus on hands-on exercises using real agricultural datasets (e.g. crop yields, rainfall, fertilizer use) to apply statistical methods like regression, ANOVA, and time-series forecasting** • **Organize problem-based scenarios (e.g. "Why did crop yield drop in Region X?") to guide students through hypothesis formulation, analysis, and interpretation .** **2. Cooperative Learning & Peer Teaching** • **Use small-group projects, where students collaboratively explore questions like fertilizer vs. yield impact, present their findings, and rotate between roles .** • **Encourage peer-teaching sessions where students explain concepts and software analyses to each other, reinforcing understanding.** **3. Retrieval Practice & Frequent Low-Stakes Quizzes** • **Implement short weekly quizzes on key concepts (e.g. interpreting regression coefficients, diagnosing multicollinearity), building long-term retention through the testing effect** • **Have students self-test by generating their own questions or using**

flashcards for statistical terms and formulae.

4. Structured Note-Taking & Learning Reflection

- **Teach the Cornell note-taking system: divide notes into keywords/questions, detailed notes, and summary sections to enhance later review.**
- **Use KWL charts ("What I Know," "What I Want to Learn," "What I Learned") at the start and end of modules to track progress and tailor learning paths .**

10. Course Structure

Week	Hours (Theory + Practical)	Unit / Topic Name	Required Learning Outcomes	Teaching Method	Assessment Method
1	1 theory + 2 practical	Definition of statistics, its importance, historical overview, statistical symbols	Understand the concept of statistics and its importance in agriculture; recognize statistical symbols	Theoretical lectures; explanation of symbols during lectures	Essay questions and practical exercises
2	1 theory + 2 practical	Presentation, tables, charts, statistical data, grouped and ungrouped data, frequency, classes	Ability to represent data using tables and charts; distinguish between grouped and ungrouped data	Practical exercises using statistical software	Performance assessment in preparing tables and charts; presentations
3	1 theory + 2 practical	Measures of central tendency for grouped and ungrouped data	Calculate and interpret measures of central tendency	Problem-solving exercises	Written tests
4	1 theory + 2 practical	Measures of dispersion and variation for grouped and ungrouped data	Understand and apply measures of dispersion	Applied lessons	Performance assessment in calculating dispersion measures
5	1 theory + 2 practical	Probability and distributions	Understand the concept of probability and data distributions	Interactive lectures	Theoretical and practical questions
6	1 theory + 2 practical	Binomial distribution	Distinguish between distributions and their uses	Case studies and practical examples	Evaluative tests
7	1 theory + 2 practical	Normal distribution	Distinguish between distributions and their uses	Case studies and practical examples	Evaluative tests
8	1 theory + 2 practical	First mid-term exam	Comprehensive assessment of knowledge and skills acquired in the first half of the semester	Comprehensive review; mock exams	Written exam covering previous topics
9	1 theory + 2 practical	Sampling theory and point & interval estimation	Apply sampling and estimation techniques	Lectures, case studies, discussions	Short tests; analytical reports
10	1 theory + 2 practical	Hypothesis testing	Conduct hypothesis tests and interpret results	Analysis of real data	Accuracy evaluation of tests
11	1 theory + 2 practical	t-test / t-distribution	Perform t-tests and interpret results	Applied exercises	Practical tests; analytical reports
12	1 theory + 2 practical	Chi-square distribution	Perform chi-square tests and interpret results	Applied exercises	Practical tests; analytical reports
13	1 theory + 2	F-test / F-	Perform F-tests and	Applied exercises	Practical tests;

	practical	distribution	interpret results		analytical reports
14	1 theory + 2 practical	Correlation	Analyze relationships between variables using correlation	Statistical software usage	Practical tests; analytical reports
15	1 theory + 2 practical	Regression	Analyze relationships between variables using regression	Statistical software usage	Practical projects

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Available
Main references (sources)	**Dr. Khasha Mahmoud Al-Rawi 1980 Introduction to Statistics**
Recommended books and references (scientific journals, reports…)	**R. Rangaswamy – A Textbook of Agricultural Statistics (2020)**
Electronic References, Websites	https://www.youtube.com/watch?v=lIrRmAmU6p0&t=31s

Course Description Form

1. Course Name:
Northern Technical University/Agricultural Technical College
2. Course Code:
TAMO252 Food Industries
3. Semester / Year:
1/First semester/2024
4. Description Preparation Date:
2025/7/17
5. Available Attendance Forms:
My presence
6. Number of Credit Hours (Total) / Number of Units (Total)
65/2 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr.Maha A.M AL-Jawadi Email: maha.a.aljawadi@ntu.edu.iq
8. Course Objectives
Understanding the Fundamentals of Food Manufacturing **Enables students to understand the basic principles of food science and various manufacturing techniques.** **2. Identify Food Raw Materials** **Understand the characteristics and quality of raw materials used in the food industry, and how to select and process them.** **3. Understand Preservation and Storage Methods** **Understand the various methods of food preservation, such as sterilization, drying, refrigeration, and freezing, and their impact on product quality and safety.** **4. Apply Food Safety Principles** **Awareness of Good Manufacturing Practices (GMP) and Hazard Analysis and Critical Control Points (HACCP) principles to ensure food safety.** **5. Acquire Equipment Operation Skills** **Train students to use and operate food manufacturing equipment and machinery safely and efficiently.** **6. Analyze Food Product Quality**

Develop the ability to conduct physical, chemical, and microbial tests to assess the quality of food products.

7. Learn About Different Food Industries

Familiarity with basic food manufacturing processes, such as dairy products, canned goods, juices, baked goods, and oils.

8. Promoting scientific thinking and innovation

Encouraging students to think critically and innovatively in developing new food products that meet market needs.

9. Teaching and Learning Strategies

Strategy	A- Knowledge A1 - The student will explain the scientific principles of food industries and food preservation methods. 2. The student will list the basic components of food and the effects of industrial processing on them. 3. The student will explain the relationship between food properties and appropriate manufacturing techniques. B - Skills B1. Apply the manufacturing steps for various food products according to quality standards. 2. Use industrial tools and equipment in a safe and effective manner. 3. Analyze the factors affecting the quality of the final food product. 4. Conduct a preliminary sensory and chemical evaluation of selected food products. C- Values A1. Adhere to occupational safety and hygiene regulations in the manufacturing environment. 2. Demonstrate a commitment to reducing food waste and improving production efficiency. 3. Demonstrate integrity and honesty in preparing and evaluating food products.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	1+3	Knowledge of Food Science Understanding the main food industries and	Definition of Dairy Production Science Factors that Facilitate Interest and	Presentation, Explanation, Discussion Presentation, Explanation,	Oral, written, practical, and scientific reports Oral, written, practical, and

		the methods used to establish a new industry	Development in the Food Industry	Discussion	scientific reports
Week 2		Knowledge of food components	Main Objectives of Food Preservation and Processing	Presentation, Explanation, Discussion	Oral, written, practical, and scientific reports
Week 3		Explanation of lipids and vitamins	Factors to Consider When Selecting a Region or Location for Establishing a Food Processing Plant	Presentation, Explanation, Discussion	Oral, written, practical, and scientific reports
Week 4		Understanding of the main nutrients and the importance of fats in meat	Classification of Food Components	Presentation, Explanation, Discussion	Oral, written, practical, and scientific reports
Week 5		Dyes, enzymes, and flavoring agents	The Importance of Water to the Human Body	Presentation, Explanation, Discussion	Oral, written, practical, and scientific reports
Week 6		Eggs	Types of Water in Food: Carbohydrates and Proteins	Presentation, Explanation, Discussion	Oral, written, practical, and scientific reports
Week 7		Semester Exam	Definition of Lipids	Presentation, Explanation, Discussion	Oral, written, practical, and scientific reports
Week 8		Distinguishing some types of dietary oils and fats	Benefits of Lipids, Classification of Lipids, Classification of Fatty Acids, Vitamins, Minerals, Organic Acids	Presentation, Explanation, Discussion	Oral, written, practical, and scientific reports
Week 9		Grains	Types of Muscles in Meat	Presentation, Explanation, Discussion	Oral, written, practical, and scientific reports
Week 10		Food preservation methods Freezing Heat preservation	The Rigor of Putrefaction Phenomenon	Presentation, Explanation, Discussion	Oral, written, practical, and scientific reports
		Light boiling	The Difference Between White and Red Meat and Fish Meat		Oral, written, practical, and scientific reports
Week		Second Semester Exam	Characteristics		

11 Week 12 Week 13 Week 14 Week 15		Explanation of cans and their manufacture Identification and evaluation of tests performed on canned goods.	of Enzymes in Food Processing, Oxidants and Antioxidants, Allergenic Compounds Egg Proteins Steps for Freezing Eggs Distinguishing Between Fresh and Stored Eggs, The Role of Eggs and Egg Products in the Food Industry Types of Rancidity Spoilage of Oils and Fats Characteristics of Fats Components of Grains Main Types of Wheat, Milling Process, Tests Conducted on Flour to Determine Its Sustainability On bread Basic requirements for cold storage Changes that occur in food during cold storage Canning stages Peeling methods Benefits of canning medium Emptying methods		Oral, written, practical, and scientific reports

			Benefits of coating materials for cans, types of cans Detecting contamination in canned goods, the most important preservatives		

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Principles of food industries
Main references (sources)	Principles of food industries
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form Ruminants physiology

1. Course Name:
Ruminants physiology
2. Course Code:
ANP 201
3. Semester / Year:
yearly
4. Description Preparation Date:
٢٠٢٥/٦/٣
5. Available Attendance Forms:
Weekly attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hours
7. Course administrator's name (mention all, if more than one name)
Name: As. Pr. Dr. Azhar Majid Ibrahim Email: dr.azharm@ntu.edu.iq

8. Course Objectives

Course Objectives The cognitive objectives for the rumina physiology lesson focus on enabling students to understand vital functions of ruminant in a scientific and systematic mann Here are the most important cognitive objectives, systematic classified according to cognitive levels	• **Knowledge**..... • **Comprehension**..... • **Application**.....

9. Teaching and Learning Strategies

Strategy	The subject takes into account the nature of the subject as an ap scientific subject, combining theoretical and practical aspects, us combination of strategies that develop deep understanding, applied and analytical thinking among students

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
			The concept	Lectures	exam

١	٥	Understanding basic biologi processes	physiology	& esentatio n	
٢	٥	General explanation endocrine glands a their vital functions	physiology of endocrine glands and hormones	Questions, swers and discussion	Report Writin
3	5	Analysis of t relationship betwe hormones and t functions of the tar organs	ysiology of endocrine glands and hormones	Interactive lecture	Short test
4	5	Explanation of t functional structure the heart and blo vessels	e cardiovascular system	teractive lecture	Short test
5	5	Interpretation blood pressure a blood functions	The diovascula r system	Lecture, practical training	Submit a repor
6	5	Explanation of t vulnerable compositi of the respiratory syste	ysiology of the respiratory system	Interactive ture, collective discussions	Short test
7	5	Gases exchan mechanism	ysiology of the respiratory system	Interactive lecture	bmit a repor , short test
8	5	Explanation of the ma vulgar functions for t parts of the digest system	physiology of the digestive system	Interactive ture, anatomy the digestive system	Short test
9	5	Definition of vomti rumination and sal production	physiology of the digestive system	Lecture, practical training	Short test
0	5	Functions of the nervo system and its divisions	Physiology of the nervous system	Lecture, group scussions	it a repor , short test
1	5	Explanation of ner	Physiology of the	Lecture,	Write a repor

		reflexes and reactions	nervous system	group cussions	
2	5	Knowing a understanding t physiological structure the male reproducti system	Physiology of the ale reproductive system	ase study	short test
3	5	Explanation of t artificial inseminati process	Physiology of the ale reproductive system	teractive lecture	Submit a searc
4	5	Knowing a understanding t physiological structure the female reproducti system	Physiology of the female reproductive system	teractive lecture	short test
5	5	Explanation of t ovulation cycle	Physiology of the female reproductive system	Practical training	short test

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparati n, da oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Animal physiology for dr. dyaa l-ha
Main references (sources)	Animal physiology for dr. dyaa l-ha
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Reproductive physiology
2. Course Code:
ANP 202
3. Semester / Year:
Semester
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
78 / 3
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed Azeez Mohammed Email: mddazz84@ntu.edu.iq
8. Course Objectives

Course Objectives	1. **Provide students with fundamental knowledge of reproductive physiology in animals** 2. **Teach modern techniques for diagnosing and monitoring reproductive functions** 3. **Examine the impact of environmental and nutritional factors on reproductive efficiency** 4. **Apply assisted reproductive technologies (ART) such as AI and embryo transfer.**
9. Teaching and Learning Strategies	
Strategy	Course Outcomes **1. Blended Learning** Combine **interactive lectures** (hormonal pathways, reproductive cycles) **2. Hands-On Skill Development (Lab sessions)**: Semen collection/evaluation (CASA systems). **3. Problem-Based Learning (PBL)** Design solutions using **synchronization protocols** or ART

	4. Industry Integration (**Field visits)**: AI centers, embryo labs, or genetic research facilities.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Explain the structural and functional components of the male and female reproductive systems in domestic animals.	Physiological Principles of the Male and Female Reproductive Systems	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	Describe the endocrine control mechanisms governing reproductive functions.	Neural and Hormonal Control of Reproductive Function	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	Analyze the hormonal regulation of the estrous cycle and ovulation.	Role of the Pituitary Gland in Regulating Animal Reproduction	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	Interpret the physiological processes involved in spermatogenesis and oogenesis.	Sex Hormones: Mechanisms and Physiological Impacts	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
5	5	Evaluate the mechanisms of fertilization and early embryonic development..	Estrous Cycle in Females: Stages and Hormonal Regulation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	Assess the role and function of the corpus luteum during pregnancy..	Ovulation: Mechanisms and Regulatory Factors	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	Illustrate the physiological changes during gestation, parturition, and puerperium.	Cellular Physiology of the Testes and Spermatogenesis	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	Identify common reproductive disorders and explain their physiological basis..	Fertilization and Gamete Interaction Dynamics	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	Apply knowledge of reproductive physiology to clinical case scenarios related to infertility.	Hormonal Physiology of Pregnancy and Corpus Luteum Formation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	Examine the impact of stress, nutrition, and environmental factors on reproductive health	Physiological Changes During Gestation and Parturition	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11	5	Discuss the immunophysiological aspects of reproduction, including maternal-fetal tolerance	Infertility in Males and Females: Physiological Causes and Therapeutic Applications	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	Interpret diagnostic data related to reproductive hormone levels and organ function.	Reproductive Immunophysiology and Maternal Immune Adaptation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	Critically appraise the use of assisted reproductive technologies in veterinary practice.	Environmental and Stress Factors Affecting Reproductive Function	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	Formulate reproductive management strategies to improve herd fertility.	Applications of Reproductive Physiology in Veterinary Biotechnology	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	Integrate theoretical knowledge with practical skills to assess and manage reproductive health in animals.	Research Frontiers in Reproductive Physiology: From Cells to Clinical Practice	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if a	
Main references (sources)	*Geoffrey H. Arthur, David E. Noakes, Harold Pearson, and Gary C.W. England*
Recommended books and references (scientific journals, reports…)	**Veterinary Reproduction and Obstetrics**
Electronic References, Websites	https://www.elsevier.com/books/veterinary-reproduction-and-obstetrics/england/978-0-7020-7233-8 https://www.wiley.com/en-us/Fertility+and+Obstetrics+in+the+Horse%252C+3rd+Edition-p-9780470655719 http://www.fao.org/3/a-i0116e.pdf

Course Description Form

1. Course Name:	
Fish environment and life	
2. Course Code:	
ANP 203	
3. Semester / Year:	
Semester	
4. Description Preparation Date:	
17/7/2025	
5. Available Attendance Forms:	
Attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
75 / 3	
7. Course administrator's name (mention all, if more than one name)	
Name: harith nafi shuker Email: harithalmansour@ntu.edu.iq	
8. Course Objectives	
Course Objectives	**• The course focuses on understanding the interaction between fish and their aquatic environments, and its applications in sustainable management.** **• Understanding aquatic ecosystems** **• Classifying fish ecologically** **• Studying adaptive behaviors** **• Studying adaptive behaviors.**
9. Teaching and Learning Strategies	
Strategy	Course Outcomes Definition: A set of knowledge, skills, and values that a course seeks to achieve in students. Importance: It provides the learner with a clear idea of what they will be able to do after completing the course, and it helps in designing and evaluating courses. How They Are Determined: Course outcomes are determined based on the objectives of the academic program to which the

	course belongs.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	To know the concept of the aquatic ecosystem	Aquatic ecosystem, life cycle in water	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student should learn about different aquatic environments such as rivers and lakes.	Different aquatic ecosystems, rivers, lakes, and the physical and chemical properties of water, temperature, light, pH, oxygen, salinity, turbidity, and nutrients.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student should be able to describe the body of a fish.	General description of the fish body and differences in the external shape of fish	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
٤	5	The student can distinguish the internal parts of the body.	Internal body parts of fish	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
٥	5	The student will be able to classify fish.	Fish classification	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	Includes understanding and evaluating critical factors that determine fish survival and distribution,	Biological and non-biological factors affecting fish	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	Enables the student to understand abiotic (physicochemical) and biological (organism relationships) factors.	Biological and non-biological factors affecting fish	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	The student should know the effect of turbidity on fish.	Biological and abiotic turbidity and its effect on fish	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	The student should know the types of aquatic plants.	Aquatic plants and their relationship with fish	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	The student learns the nature of fish nutrition.	Fish feeding and classification of fish according to their type of feeding	Presentation, explanation, questions and answers,	Oral, written and daily practical tests and scientific reports

				discussion	
11	5	The student learns the methods of reproduction.	Fish reproduction, different methods of fish reproduction according to their species	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student should learn about the types of fish migration.	Fish migration, types of fish migration and methods of studying it	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student should know the effect of pollution on fish.	Aquatic environment pollution and its impact on fish	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student should learn about fishing methods.	Fishing methods and means	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student will be able to identify the size of fish populations in the aquatic environment.	The size of fish populations in the aquatic environment and their relationship with fishing methods	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Sustainable Management of Fisheries Resources Khaled El Sayed
Main references (sources)	Egyptian Journal of Aquatic Research،Elsevier
Recommended books and references (scientific journals, reports…)	Egyptian Journal of Aquatic Research،Elsevier
Electronic References, Websites	**WorldFish Publications** worldfishcenter.org/publications

Course Description Form

1. Course Name:
Northern Technical University/Agricultural Technical College
2. Course Code:
ANP204 Dairy Production Techniques
3. Semester / Year:
1/First semester/2024
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
My presence
6. Number of Credit Hours (Total) / Number of Units (Total)
65/2 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr.Maha A.M AL-Jawadi Email: maha.a.aljawadi@ntu.edu.iq
8. Course Objectives
Educating students about safe and effective dairy product manufacturing processes, including understanding packaging and storage processes. Enhancing students' understanding of the properties of milk and its derivatives and their impact on food quality and safety. Encouraging students to develop production, heat treatment, and sterilization skills in the dairy industry. Raising awareness of the importance of quality control and compliance with health standards in the industrial sector.
9. Teaching and Learning Strategies

Strateg	A- Knowledge A1 - The student will explain the components of milk and the effect of each component in the manufacture of dairy products. 2. The student will explain the various industrial processes (pasteurization, homogenization, fermentation, sterilization) in dairy production. 3. The student will identify the health and storage requirements required in dairy factories. B - Skills B1 - The student will apply the steps for producing various dairy products, such as milk, cheese, yogurt, and cream. 2. The student will use basic equipment and machinery in the dairy production unit efficiently and safely. 3. The student will conduct simple tests to assess the quality of milk and dairy products (sensory, physical, and chemical tests).

	C- Values A1. The student must adhere to occupational health and safety procedures within the dairy plant. 2. The student must demonstrate discipline and accuracy while working on the production lines. 3. The student must observe ethical and professional standards in dealing with colleagues and food products.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1 Week 2 Week 3 Week 4 Week 5	1+3	Acquire knowledge and skills, and familiarize students with the science of food industries. Understand the chemical composition of milk fat and milk proteins. Explain milk sugar (lactose) and milk enzymes. Understand the mineral salts in milk and milk vitamins. Distinguish the microscopic components of milk and the physical	Definition of Dairy Production Science The importance of studying the nutritional and economic components of milk Chemical and physical classification of milk components Milk compounds and their relationship to the food industry Fatty acids Physical properties of milk fat The importance of casein and whey proteins The nutritional and economic importance of lactose Properties, benefits, and types of milk enzymes Introduction to the divisions and importance of milk minerals Salt balance	Presentation, Explanation, Discussion Presentation, Explanation, Discussion Presentation, Explanation, Discussion Presentation, Explanation, Discussion Presentation, Explanation, Discussion Presentation, Explanation, Discussion Presentation, Explanation,	Oral, written, practical, and scientific reports Oral, written, practical, and scientific reports Oral, written, practical, and scientific reports Oral, written, practical, and scientific reports Oral, written, practical,

Week 6 Week 7 Week 8 Week 9 Week 10 Week 11 Week 12		properties of milk. Understand the viscosity of milk, skimmed milk, and microorganisms. Exam. Distinguish the classification of bacteria present in milk and diseases transmitted through milk. Understand the mechanism of milk spoilage by biology and technological processes. Understand filters and their types and homogenize milk. Understand and evaluate the thermal treatments applied to milk and milk products and the Pearce square. Two-semester exam. Explain and evaluate the	The importance of milk vitamins Color, taste, smell, and flavor Specific gravity and density of milk Boiling and freezing point of milk, osmotic pressure of milk Factors affecting milk viscosity Components of skimmed milk The importance of studying milk microorganisms and their sources Types of bacteria, typhoid fever Changes that occur in milk Microorganisms that cause spoilage of milk and milk products Heat treatments Factors affecting homogenization Factors that cause granule aggregation Fat Effect of homogenization on milk properties Cooling (tanks, surface coolers) Heat treatments (slow, rapid, and vacuum pasteurization) How to adjust fat percentages in milk and milk products using the	Discussion Presentation, Explanation, Discussion Presentation, Explanation, Discussion Presentation, Explanation, Discussion	and scientific reports Oral, written, practical, and scientific reports Oral, written, practical, and scientific reports Oral, written, practical, and scientific reports Oral, written, practical, and scientific reports Oral, written, practical, and scientific reports Oral, written, practical, and scientific reports Oral, written, practical, and

Week 13 Week 14 Week 15		Pearce square. Explain and evaluate the Pearce square.	Pearson square		scientific reports

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12. Learning and Teaching Resources	
Required textbooks (curricular books any)	Principles of dairy manufacturing
Main references (sources)	Principles of dairy manufacturing
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
buffalo and camel production
2. Course Code:
ANP 205
3. Semester / Year:
Semester
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
78 / 8
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed Waad Mohammed Email: mohammed.waad88@ntu.edu.iq
8. Course Objectives

Course Objectives	**A1- Commitment to ethical practices in managing buffalo production farms to ensure the quality of animal products.** **A2- Promoting the concept of sustainability by implementing strategies that reduce negative environmental impact.** **A3- Teamwork and cooperation in scientific research and practical applications within laboratories and farms.** **A4- Commitment to professional standards in managing buffalo and camel production projects.**

9. Teaching and Learning Strategies	
Strategy	Course Outcomes Definition: A set of knowledge, skills, and values that a course

	seeks to achieve in students. Importance: It provides the learner with a clear idea of what they will be able to do after completing the course, and it helps in designing and evaluating courses. How They Are Determined: Course outcomes are determined based on the objectives of the academic program to which the course belongs.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Definition of buffalo and camel	Interactive lecture	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	Explain the economic importance of buffalo and camels	Subheadings Defining the Problem Formulating Questions	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	Scientific and productive classification of buffalo and camel	Importance How Types and Evaluation of These Types	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
٤	5	Breed selection, herd size, purchase, and age grading	The student will be able to classify animals based on different species and breeds.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
٥	5	Feeding camels and buffaloes	The student will be able to identify the types of feeding.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	Meat production from camels and buffaloes	Importance	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	Milk production from camels and buffaloes	Importance	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	Methods of reproduction, anatomy of the reproductive system of camels and buffaloes, and hormonal control of the reproductive process	Types and Care Methods Training Education	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	Pregnancy and childbirth	Types and Care Methods Training	Presentation, explanation,	Oral, written and daily practical

			Education	questions and answers, discussion	tests and scientific reports
10	5	Maternal and newborn care	Why study?	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	Animal transport and animal transport vehicles	Lecture, workshop	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	buffalo and camel pens	Lectures, practical software training, workshops	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	Marketing methods with an explanatory program for marketing types	Lectures, practical software training, workshops	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	Growth and development in buffaloes and camels	Lectures, practical software training, workshops	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	Environment and Management	Environment and Management	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	• Book on raising buffaloes and camels/Dr. Rady Khattab
Recommended books and references (scientific journals, reports…)	Book of(The course that camel surra runs in ponies,Buffaloes and other animals)/by H.E.Cross
Electronic References, Websites	Wekipedia.org buffalo and camel

Course Description Form

1. Course Name:

Food Analysis

2. Course Code:

ANP207

3. Semester / Year:

Second / 2025

4. Description Preparation Date:

17/7/2025

5. Available Attendance Forms:

In-person

6. Number of Credit Hours (Total) / Number of Units (Total)

75

7. Course administrator's name (mention all, if more than one name)

Name: Ahmed Abdul-Muhsin Qasim
Email: ahmed.qa@ntu.edu.iq

8. Course Objectives

Course Objectiv	1. To prepare students to work efficiently in the field of feed analysis and composition based on modern scientific approaches aligned with developments in advanced countries. 2. To enable students to enter the agricultural sector effectively by participating in governmental projects and the job market. 3. To guide students toward gaining better experience for postgraduate studies applications.

9. Teaching and Learning Strategies

Strategy

Definition: A set of knowledge, skills, and values that the course aims to develop in stude
Importance: Provides the learner with a clear understanding of what they will be able to do by end of the course and helps in course design and assessm
How they are determined: CLOs are defined based on the academic program objectives to wh the course belongs.

Learning Outcomes	Teaching & Learning Methods	Assessment Methods
Knowledge 1. Student explains the scientific	Theoretical explanation, illustrative examples,	Quizzes, oral, written, and practical daily exams,

principles of food analysis. 2. Student lists the basic components of food analysis. 3. Student explains the relationship between food analysis and production.	brainstorming, and video presentations.	scientific reports.
Skills 1. Apply steps of producing various food products according to quality standards. 2. Use laboratory tools and equipment safely and efficiently. 3. Analyze factors affecting the final food product quality. 4. Conduct preliminary sensory and chemical evaluation of certain food products.	Case studies, presentations, field visits, discussions, group activities, showcasing successful experiments.	Field reports, self-assessment, problem-solving and decision-making, presentations, oral tests.
Values 1. Commitment to professional safety and hygiene rules in the lab. 2. Show interest in reducing food waste and improving production efficiency. 3. Demonstrate honesty and integrity in preparing and evaluating food analyses.	Discussions, group activities.	Observation of practical behavior to assess teamwork, value-based self-evaluation, and professional conduct.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	3+2	Understands the science of food analysis and its related terminology and structure.	Introduction to Food Analysis	Lecture, video presentation	Theory, oral, class questions, reports
Week 2	3+2	Explains general principles of food analysis, use of tools and techniques.	—	Lecture, video presentation	Theory, oral, class questions, reports
Week 3	3+2	Understands the importance of food analysis, and the factors	Importance of Food Analysis	Lecture, video presentation	Theory, oral, class questions, reports

		influencing method selection.			
Week 4	3+2	Applies analysis steps, interprets results, compares with standards, writes full report.	Protein Determination	Lecture, practical application, teamwork	Self-assessment, class questions
Week 5	3+2	Same as Week 4	Carbohydrate Determination	Lecture, practical application, teamwork	Self-assessment, class questions
Week 6	3+2	Same as Week 4	Crude Ash Determination	Lecture, practical application, teamwork	Self-assessment, class questions
Week 7	3+2	Same as Week 4	Fat Determination	Lecture, practical application, teamwork	Self-assessment, class questions
Week 8	—	Midterm Exam	—	—	—
Week 9	3+2	Student understands the digestive system of ruminants	Ruminant Digestive System	Lecture, video presentation	Theory, oral, class questions, reports
Week 10	3+2	Student understands digestion and absorption in ruminants	Digestion and Absorption in Ruminants	Lecture, video presentation	Theory, oral, class questions, reports
Week 11	3+2	Student learns about types of microorganisms in ruminants	Microorganisms in Ruminants	Lecture, video presentation	Theory, oral, class questions, reports
Week 12	3+2	Student understands types of nutritional balances	Nutritional Balances	Lecture, video presentation, practical application	Theory, oral, class questions, reports
Week 13	3+2	Student understands major gases in the rumen	Rumen Gases	Lecture, video presentation	Theory, oral, class questions, reports
Week 14	3+2	Same as Week 4	Mineral and Trace Element Determination	Lecture, video presentation	Theory, oral, class questions,

					reports
Week 15	—	Final Exam	—	—	—

11. Course Evaluation

Assessment Item	Frequency / Number	Weight (%)	Week
Quizzes	2	10%	Weeks 2 & 8
Lab Projects	1	10%	Weeks 6 & 12
Assignments	2	10%	Ongoing
Reports	1	10%	Week 13
Midterm Exam	2 hours	10%	Week 8
Final Exam	3 hours	50%	Week 15
Total Assessment	—	**100%**	—

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Available
Main references (sources)	*Artificial Intelligence Program*
Recommended books and references (scientific journals, reports…)	*Food Analysis – Basel Dalali*

Course Description Form

1. Course Name:
Dairy cattle production
2. Course Code:
ANP208
3. Semester / Year:
Second semester/2024-2025
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Presence + Electronic
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hours (2 hours theoretical + 3 hours practical) / 3 units
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Lect. Mohammed Ali Gharbi Email: mohammad.a.gharbi@ntu.edu.iq
8. Course Objectives
1. Providing students with theoretical knowledge about different breeds of dairy cattle and their economic and social importance. 2. Introducing students to the principles of animal production science related to dairy cattle management, as well as training students on proper feeding methods and ration management to improve productivity and milk quality. 3. Developing a comprehensive understanding of the milk production cycle from insemination to the dry season. 4. Enhancing students' abilities to apply genetic improvement techniques to select highly productive breeds. 5. Introducing students to the concepts of environmental management and appropriate housing to increase milk production. 6. Enabling students to evaluate the economic feasibility of dairy cattle production projects, analyze production costs and revenues, and introduce students to modern marketing methods for milk products and derivatives. 7. Teaching students how to implement sustainable practices in dairy cattle farming, ensuring the conservation of natural resources, and promoting the concept of animal

welfare at all stages of production.

8. Developing students' scientific research skills to contribute to solving problems facing the dairy cattle production sector.

9. Teaching and Learning Strategies

First: Teaching Strategies for Theoretical Lectures

1. Interactive Lecture:

• Present basic information while asking open-ended questions.

• Use brainstorming to stimulate critical thinking.

• Engage students in discussing field problems.

2. Multimedia Presentation:

• Use PowerPoint with images and videos on: automated milking, housing systems, and characteristics of dairy cows.

3. Problem-Based Learning:

• Present real-life problems from dairy farms.

• Assign students to analyze the problem and propose scientific solutions.

4. Cooperative Learning:

• Divide students into small groups.

• Each group studies a specific aspect (e.g., nutrition, housing, breeds) and presents it to the rest of the class.

Second: Teaching Strategies for the Practical Aspect

1. Demonstration and Practice:

• Practical demonstration in the field or barn.

2. Field Visits:

• To dairy farms or dairy farms.

• Linking theory to practice.

3. Project-Based Learning:

• Assigning students to develop a practical project, such as a feeding plan for a dairy herd or an economic feasibility study for a dairy farm.

4. Self- and Peer Assessment:

• Training students to evaluate their own and their peers' performance during practical exercises.

5. Video-Based Learning:

• Using educational videos to explain precise practical steps (such as artificial insemination, healthcare, manual or mechanical milking).

Third: Methods for Enhancing Learning

• Using an electronic platform (such as Google Classroom) to share lectures, videos, and tests.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theoretical + 3 practical	Acquire knowledge and skills	Introduction and Introduction to Dairy Cattle	Introductory lecture and discussions about the curriculum	Homework
2	2 theoretical + 3 practical	Introduce students to dairy cattle	Classification and Breeds of Cattle	Presentation, explanation, questions and answers, discussion	Quiz Exam
3	2 theoretical + 3 practical	Understand the most important challenges facing livestock breeding	Challenges and Development of Cattle Production	Presentation, explanation, questions and answers, discussion	Report
4	2 theoretical + 3 practical	Breeding methods and producing high-yielding breeds	Reproductive Efficiency and Its Improvement in Cattle	Presentation, explanation, questions and answers, discussion	Quiz Exam
5	2 theoretical + 3 practical	Understand the structure and functions of the udder	Anatomy and Function of the Lactate Gland and Milk Production	Presentation, explanation, questions and answers, discussion	Oral Questions and Answers
6	2 theoretical + 3 practical	Explain the mechanism of milk	Hormonal Regulation and	Presentation, explanation,	Homework

		production	**Factors Affecting Milk Production**	**questions and answers, discussion**	
7	**2 theoretical + 3 practical**	**Knowledge of genetic improvement programs**	**The Role of Genetics in Improvement**	**Presentation, explanation, questions and answers, discussion**	**Homework**
8	**2 theoretical + 3 practical**	**Identify factors affecting milk production**	**Methods of Genetic Improvement in Cattle**	**Presentation, explanation, questions and answers, discussion**	**Quiz Exam**
9	**2 theoretical + 3 practical**	**Distinguish productive traits of breeds**	**The Difference Between Dairy and Beef Cattle**	**Presentation, explanation, questions and answers, discussion**	**Report**
10	**2 theoretical + 3 practical**	**Apply nutritional principles to dairy cattle**	**Feeding Cattle and Preparing Balanced Feeds**	**Presentation, explanation, questions and answers, discussion**	**Quiz Exam**
11	**2 theoretical + 3 practical**	**Understand methods for servicing dairy cows**	**Care for Pregnant Mothers and Their Newborns**	**Presentation, explanation, questions and answers, discussion**	**Oral Questions and Answers**
12	**2 theoretical + 3 practical**	**Master common milking methods and the factors surrounding them**	**Healthy and Clean Milk Production: Prevention of Pathogens and Spoilage**	**Presentation, explanation, questions and answers, discussion**	**Homework**
13	**2 theoretical + 3 practical**	**Identify diseases surrounding the animal and methods for preventing them**	**Cattle Health and Disease Prevention**	**Presentation, explanation, questions and answers, discussion**	**Quiz Exam**
14	**2 theoretical + 3 practical**	**Understand dairy farm management**	**Cattle Farm Management: Breeding, Care, and Marketing**	**Introductory lecture and discussions about the curriculum**	**Report**
15	**2 theoretical + 3 practical**	**Estimate the economic efficiency of production**	**Continued / Cattle Farm Management: Breeding, Care, and**	**Presentation, explanation, questions and**	**Quiz Exam**

			Marketing	**answers, discussion**	

11. Course Evaluation

Grade Distribution (out of 100) Based on Assigned Student Tasks:

Daily Quizzes = 10 marks
Projects = 10 marks
Midterm Practical Exam = 10 marks
Reports = 10 marks
Monthly Theoretical Tests = 10 marks
Final Practical Exam = 25 marks
Final Theoretical Exam = 25 marks

12. Learning and Teaching Resources

Required textbooks	**Livestock Breeding, Feeding and Care, Mohamed Khairy Mohamed Ibrahim**
Main references	**Dr. Faisal Al-Baraka (and Asst. Res. Amer Al-Haddadin). (2011). Guide to Dairy Cattle Rearing.** **Prof. Dr. Natiq Hameed Al-Qudsi & Jiyal Victor Elia. (2010). Dairy Cattle Production.**
Recommended books and references	**Dr. Mohammed Ali Makki Al-Rubaie. (2020). Dairy Cattle Production. University of Wasit, Iraq.** **Journal of Dairy Science ،Animal Production Science ،Animal Science Journa**
Electronic References, Websites	**https://www.fao.org/dairy-production-products/a0r/**

Course Description Form

1 .Course Title:
Genetics
٢.Course Code:
ANP 209
٣.Level / Academic Year:
second Year / 2024–2025
4.Date of Description Preparation:
17/07/2025
5.Available Attendance Modes:
In-person
6.Total Credit Hours / Units:
60 hours (1 theoretical + 3 practical) × 15 weeks
7.Course Coordinator (All names if multiple):
Name: Hanin Mowaffaq Ahmed Email: haneen.mowfak@ntu.edu.iq
8.Course Objectives:
• Understanding the fundamental principles of genetics, including Mendel's laws and various inheritance patterns. • Analyzing genetic material (DNA and RNA) and their roles in the transmission of traits and gene expression. • Identifying mechanisms of trait inheritance from parents to offspring and explaining genetic mutations and their effects. • Applying genetic concepts to improve animal and plant production through selection and hybridization. • Interpreting modern applications in genetics, such as genetic engineering and gene editing
9. Teaching and Learning Strategies:
• Discussion and dialogue strategy • Brainstorming • Self-learning • Group collaborative assignments

- Report writing task

10.Course Structure:

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4 Hours (1Theory+3 3 Practical)	The student should **identi** cell components and **distinguish** between type cell division. **(A, B)**	Cell and Cell Divis	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports.
2	4 Hours (1Theory+3 3 Practical	The student should **expla** the relationship between division and sexual reproduction. **(B, C)**	Reproduction, Meiosis, and Sexu Differences in Ani	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports.
3	4 Hours (1Theory+3 3 Practical	The student should **analy** gene structure and the function of the genetic co **(D)**	Genetic Code and Molecular Structure of Gene	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports
4	4 Hours (1Theory+3 3 Practical	The student should **apply** Mendel's laws to genetic cases. **(C, B)**	Gregor Mendel, H Experiments, Gene Mendelian Equatic Dominant and Recessive Genes	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports
5	4 Hours (1Theory+3 3 Practical	The student should **comp** types of dominance and **analyze** the results. **(D, E**	Incomplete Dominance, Feath Color Inheritance, Sex-Influenced Tra	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports
6	4 Hours (1Theory+3 3 Practical	The student should **construct** genetic crosses based on dominance and influenced traits. **(C, F)**	Incomplete Dominance, Feath Color Inheritance, Sex-Influenced Tra	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports
7	4 Hours (1Theory+3 3 Practical	The student should **distinguish** between gene types and **evaluate** their effects on the organism. **(E)**	Lethal and Semi-Lethal Genes, Vitality-Reducing Genes, and Super-Vital Genes	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports
8	4 Hours (1Theory+3 3 Practical	The student should **analy** sex-linked trait inheritanc and **interpret** inheritance patterns. **(D, B)**	–	Presentation, explanation, Q&A, interactive discussion, self-learning.	Written examination
9	4 Hours (1Theory+3 3 Practical	The student should **apply** concept of crossing over pedigree analysis. **(C, D)**	Alleles and Multip Effects (Pleiotropy	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports

10	4 Hours (1Theory+3 3 Practical	The student should **create** genetic map using crossir over percentages. **(F)**	**Genetic Mapping** How to draw a genetic map based crossing-over rates and determining g location	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports
11	4 Hours (1Theory+3 3 Practical	The student should **classi** mutation types and **analy** their genetic effects. **(B, I**	**Genetic Mutation** Types of mutations (point mutations, deletions, insertion their causes, and th	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports
12	4 Hours (1Theory+3 3 Practical	The student should **apply** Hardy-Weinberg's law to genetic populations. **(C)**	**Population Genet** – Genetic equilibri and the Hardy-Weinberg Law	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports
13	4 Hours (1Theory+3 3 Practical	The student should **desig** breeding programs using mutations and selection. **(**	**Quantitative Genetics** – Polyge traits, genetic and environmental variation	Presentation, explanation, Q& interactive discussion, self-learning.	Written examination
14	4 Hours (1Theory+3 3 Practical	The student should **synthesize** knowledge to solve comprehensive gen problems. **(F, E)**	**Applications of Genetics in Genet Improvement and Animal Breeding** Selection, hybridization, and genetic improveme program	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports
15	4 Hours (1Theory+3 3 Practical		**General Review a Practical Exam** – Includes analysis c genetic problems, mapping, pedigree and multiple trait	Presentation, explanation, Q& interactive discussion, self-learning.	Oral, written and practica daily assessments and scienti reports

11.Course Evaluation

Grade distribution out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral tests, monthly or written exams, reports, etc

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	أسس الوراثة/ د.عبد الحميد عبدالله الهيتي
Electronic References, Websites	

Course Description Form

1. Course Name:
Meat technology and marketing
2. Course Code:
ANP٢٥٢
3. Semester / Year:
Semester
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
78 / 8
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed Waad Mohammed Email: mohammed.waad88@ntu.edu.iq
8. Course Objectives

Course Objectives	**• Provide students with basic knowledge about meat varieties.** **• Learn about the latest technologies used in meat farm management.** **• Analyze the impact of nutrition and breeding on the quality of meat produced.** **• Use modern technologies to improve production.**

9. Teaching and Learning Strategies

Strategy	Course Outcomes Definition: A set of knowledge, skills, and values that a course seeks to achieve in students. Importance: It provides the learner with a clear idea of what they will be able to do after completing the course, and it helps in designing and evaluating courses. How They Are Determined: Course outcomes are determined based on the objectives of the academic program to which the

	course belongs.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student should know the concept of meat science.	Introduction to meat science	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	Meat production and its relationship to the meat industry	Conditions to be considered when establishing meat production farms and slaughterhouses	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The biological importance of meat production	The importance of meat for the human body	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will understand the types of poultry.	Origin and Classification of Poultry	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	Classification of types of meat	Carcass cuts	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
5	5	Per capita share of domestic production	Total share per person	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	Meat production patterns	Environmental factors affecting meat production	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	Definition of marketing	Marketing science	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	Modern technologies in marketing systems	Modern marketing technologies	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	Marketing issues	Marketing problems	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	Marketing types	Marketing channels	Presentation,	Oral, written and

		illustrative program		explanation, questions and answers, discussion	daily practical tests and scientific reports
11	5	Animal transport and animal transport vehicles	Means of transportation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	Growth and development of meat animals	Changes in carcass components	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	Changes in the proportions of carcass components	Carcass components ratios	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	Optimal investment for efficient meat production	Meat production efficiency	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
١٥	٥	Environment and management	Environment and management for meat animals	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	• Primary sources: Lectures by Asst. Prof. Dr. Amira Mohammed Saleh Al-Rubaie / University of Baghdad, College of Agricultural Engineering Sciences • Book of meat production /ghon ewart
Recommended books and references (scientific journals, reports…)	• Al-Taie, Munir Abboud and Al-Moussawi, Umm Al-Bashar Hamid Jaber (1992). Practical Meat and Fish Technology. College of Agriculture, University of Basra, 142 pages. • Al-Shareek, Youssef Mohammed (2005). Meat Technology. Al-Fateh University Publications, Tripoli, Libya, 376 pages. • Al-Afandy, Salah Mahmoud Youssef (2012). Meat Health and Safety, General Authority for Export and Import Control, Arab Republic of Egypt, 100 pages.
Electronic References, Websites	Meat production and processing on wekibidia Wekipedia.org

Course Description Form

1. Course Name:
fingerling production
2. Course Code:
ANP 255
3. Semester / Year:
Semester
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
٧٥/ ٣
7. Course administrator's name (mention all, if more than one name)
Name: harith nafi shuker Email: harithalmansour@ntu.edu.iq
8. Course Objectives

Course Objectives	**• The general objectives of the Fish Fingerling Course focus on gaining experience in understanding the management of the most sensitive stage of fish farming. The main components available to you for decision-making are:** **• 1. Tourist Inspiration (Knowledge and Understanding):** **• Understand the fish life cycle (egg → larva → fingerling → fry → adult).** **• Subsequent study of fingerlings (growth, nutrition, behavior).** **• Analyze the harmful factors affecting fingerling survival (temperature, oxygen, ammonia, pH).** **• Know common diseases and methods of preventing them at this stage.**

	2. Applied Transfer (Appropriate Skills): **• Learn techniques for transferring fingerlings between laboratories without laboratories.** **• Design appropriate feeding programs (feed types, email, publishers).** **• Implement basic water quality monitoring and control methods.** **• Diagnose and treat chronic diseases or illnesses.** **• 3. Strategic Options (Planning and Management):** **• Develop hatchery management to provide fingerling survival services.** **• Analyze the economic feasibility of fingerling rearing (costs, losses, and specialization).** **• Understand the role of fingerlings in fish sustainability (maintaining fish stocks and combating overfishing).** **• 4. No Choice in the Labor Market:** **• Qualify job seekers in fish farming, hatcheries, and aquatic research centers.** **• Utilize them from project management, strong aquaculture, and from the fingerling stage.**

9. Teaching and Learning Strategies

Strategy	Course Outcomes Definition: A set of knowledge, skills, and values that a course seeks to achieve in students. Importance: It provides the learner with a clear idea of what they will be able to do after completing the course, and it helps in designing and evaluating courses. How They Are Determined: Course outcomes are determined based on the objectives of the academic program to which the course belongs.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	He does not know the concept of fish fingerling production.	Fish reproductive biology, development of reproductive organs	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student should learn the steps of producing fish eggs and sperm.	Production of eggs and sperm, fertilized egg	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student should distinguish between external and internal factors that affect reproduction.	Control of the reproductive cycle, external and internal factors	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student demonstrates knowledge by being able to describe (brood preparation, hormone injection, egg collection, fertilization, hatching)	Artificial fish propagation, definition and importance	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
5	5	The student knows the classification of hormones according to their function (stimulating sexual maturation - causing ovulation - inhibiting reproduction)	Types of hormones used in artificial reproduction	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	Student knowledge of mother selection criteria	Artificial propagation techniques and steps. Selection and preparation of mothers.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	1. The student must have the knowledge to choose the appropriate hormone. 2. Accurately calculate the dosage.	Hormonal induction and sexual stimulation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	The student should know how to simplify the critical steps (fertilization, egg washing, incubation)	Artificial insemination and preparation of fertilized eggs for incubation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	The student should have information about egg incubator conditions (temperature, oxygen, lighting) to prevent fungal growth.	Artificial hatching and rearing of hatched larvae in the laboratory	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	Students learn the basic biological phenomena to observe in larvae (e.g., yolk sac reabsorption, organ development).	Biology of fish larvae rearing	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	Students were able to apply intensive rearing	Fingerling production method	Presentation, explanation,	Oral, written and daily practical

		techniques to transform larvae into healthy fingerlings,		questions and answers, discussion	tests and scientific reports
12	5	To know the technical and economic specifications of fingerlings ready for marketing or transport to production farms.	Production of advanced fingerlings (kidneys)	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student learns the practical side of pond management (such as heating and ventilation system).	Wintering of fingerlings and mothers	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	To include operations management to achieve high production efficiency and sustainable quality.	Organization of work and production in hatcheries	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student will be able to distinguish the applications of genetics to improve the productivity of mothers and the quality of breeds.	Inheritance and selection of mothers	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Fish Farming: From Hatching to Marketing, Dr. Muhammad Ali Hassan, "Fish Farming in Arid Areas" (Dr. Issam Haji, 2022).
Recommended books and references (scientific journals, reports…)	Handbook on Fish Production ،Larval Fish Nutrition
Electronic References, Websites	https://www.fao.org/4/y4162e/y4162e00.htm

Course Description Form

1. Course name:	
Biochemistry	
2. Course code:	
TAMO 302	
3. Level/Academic Year:	
Level Three \ 2024-2025	
4. Description preparation date:	
17/7/2025	
5. Available attendance forms:	
Paper form containing name, Date of attendance and signature	
6. Number of credit hours (total) / Number of units (total):	
75/3	
7. Name of course supervisor (mention all names if there are multiple supervisors):	
Name: Dr. Hala Aouf Abdel Rahman amyl: dr_hala.awf.chilmeran@ntu.edu.iq	
8. Course objectives:	
At the end of the course, the student is expected to be able to:for me: 1. Understand the basic principles of chemistry.vitality 2. Identify the types of metabolic processes (destruction and construction) in cells. 3. RecognitiononCellular respiration and active metabolism. 4.Understanding how enzymes act as cofactors in biological reactions 5.Understanding the biological and regulatory balance of biological processes 6.Learn about the structure and functions of	**Course objectives:**

biomolecules and vitamins. 7.Understanding how energy is produced in living cells	

9. Teaching and learning strategies:

There are many effective strategies for teaching the subject.**Biochemistry**, which aims to promote a deep understanding of genetic concepts and develop critical thinking skills.They have: 1. Learning based on dialogue and discussion. 2. brainstorming. 3. cooperative learning. 4. simulation-based learning. 5. Practical training. 6. Self-learning.	Strategy:

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	watches	week
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Introduction to Biochemistry	1-To knowFStudent basic concepts in chemistryVitality 2-For the student to understandChemical composition of cell parts.	5	1
Questions and answers + exercise solutions	Lecture, presentation, illustrations	sugars	1- The student should know that sugars are important molecules in metabolic processes. 2- The student	5	2

			should understand that sugars are the main source of energy needed to perform the body's functions.		
Questions and answers + exercise solutions	Lecture, presentation, illustrations	sugars	1- The student should knowTypes of monosaccharides, disaccharides, and polysaccharides 2- For the student to understandChemical composition of sugarsMono, dual, and multi	5	3
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Fats	1- The student should know the importance and functions of fats. 2- The student should know the difference between oils and fats.	5	4
Questions and answers + exercise	Lecture, presentation,	Fats	1- The student should know the	5	5

solutions	illustrations		chemical composition of neutral fats. 2- The student should know the importance of fats for energy production.		
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Fats	1- The student should know the difference between saturated and unsaturated fats. 2- The student should know about fat metabolism.	5	6
Questions and answers + exercise solutions	Lecture, presentation, illustrations	Amino acidsand peptides	1- The student should know the types of amino acids. 2- The student should understand the importance of amino acids for plants.	5	7

Questions and answers + exercise solutions	Lecture, presentation, illustrations	Amino acids and peptides	1-The student should know the types of amino acids.And how they are linked to form peptides 2- For the student to understandAExamples of existing peptidesFor plants	5	8
Questions and answers + exercise solutions	Lecture, presentation, illustrations	proteins	1- The student should know the concept of proteins and their importance. 2- The student understands the functions of proteins.	5	9
Questions and answers + exercise solutions	Lecture, presentation, illustrations	proteins	1- The student will be able to identify the types of globular and fibrous proteins. 2- The student understands the shapes and composition	5	10

			of proteins.		
Questions and answers + exercise solutions	Lecture, presentation, illustrations	enzymes	1- To enable the student to understand the role of enzymes as catalysts in biological reactions. 2- The student should understand the mechanism of enzyme action.	5	11
Questions and answers + exercise solutions	Lecture, presentation, illustrations	enzymes	1- The student should know the types of enzymes. 2- The student should understand the activity of the enzyme, the active site of the enzyme, and the specific activity of the enzyme.	5	12
Questions and answers + exercise solutions	Lecture, presentation, illustrations	enzymes	1- The student should know the theories of enzyme	5	13

			action.		
Questions and answers + exercise solutions	Lecture, presentation, illustrations	nucleic acids	1- The student should know the importance of nucleic acids. 2- The student understands the chemical composition of nucleic acids.DNA, RNA	5	14
Questions and answers + exercise solutions	Lecture, presentation, illustrations	nucleic acids	1- The student should know the types of DNA.RNA 2- The student should understand the difference betweenfor nucleic acidsDNA, RNA	5	15

11. Course Evaluation:	
Tests + Exercises + Discussions + SubmissionsQuestions	
12. Learning and teaching resources:	
The vocabulary prescribed by the Ministry of Higher Education and Scientific Research	Required textbooks (curriculum books, if any)
Fundamentals of Biochemistry Dr. Sami Al-Muzaffar Leininger's Fundamentals of Biochemistry	Main References (Sources)

2021	
Google Scholar, the scientific researcher portal	Recommended books and references (scientific journals, reports...)
All sites that provide reliable sources and also artificial intelligence tools	Electronic references, websites

Course Description Form

1. Course Name:

Animal Nutrition

2. Course Code:

ANP301

3. Semester / Year:

Second / 2025

4. Description Preparation Date:

17/7/2025

5. Available Attendance Forms:

In-person

6. Number of Credit Hours (Total) / Number of Units (Total)

75/3

7. Course administrator's name (mention all, if more than one name)

Name: Ahmed Abdul-Muhsin Qasim
Email: ahmed.qa@ntu.edu.iq

8. Course Objectives

Course Objectiv	1. To prepare students to work efficiently in the field of animal nutrition and feed formulation based on modern scientific approaches aligned with developments in advanced countries. 2. To enable students to enter the agricultural sector effectively by participating in government projects and the job market. 3. To guide students toward gaining better experience when applying for postgraduate studies.

9. Teaching and Learning Strategies

Strategy

Definition: A set of knowledge, skills, and values that the course aims to develop in stude
Importance: Provides the learner with a clear understanding of what they will be able to do by end of the course and helps in course design and assessm
How they are determined: CLOs are defined based on the academic program objectives to wh the course belongs.

Learning Outcomes	Teaching & Learning Methods	Assessment Methods
Knowledge 1. Student explains the scientific	Theoretical explanation, illustrative examples,	Quizzes, oral, written, and daily practical exams,

principles of animal nutrition. 2. Student lists the basic components of animal nutrition. 3. Student explains the relationship between animal nutrition and production.	brainstorming, and video presentations.	scientific reports.
Skills 1. Apply steps of producing various food products according to quality standards. 2. Use industrial tools and equipment safely and effectively. 3. Analyze factors affecting the final food product quality. 4. Conduct preliminary sensory and chemical evaluation of certain food products.	Case studies, presentations, field visits, discussions, group and collaborative activities, showcasing successful experiments.	Field reports, self-evaluation, problem-solving and decision-making, presentations, field visits, oral discussions.
Values 1. Commitment to professional safety and hygiene rules in the nutrition environment. 2. Show interest in reducing food loss and improving production efficiency. 3. Demonstrate honesty and integrity in preparing and evaluating food products.	Discussions, group activities.	Observation of practical behavior to assess teamwork, value-based self-evaluation, professional conduct.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	3+2	Understanding of animal nutrition science.	Overview of Animal Nutrition	Presentation, explanation, discussion	Oral, written, daily practical tests, scientific reports
Week 2	3+2	Student learns important laboratory guidelines.	General Laboratory Instructions and Guidelines	Presentation, explanation, discussion	Oral, written, daily practical tests, scientific reports
Week 3	3+2	Student understands the	Role of Water and Its Requirements in the Body	Presentation, explanation,	Oral, written, daily

		importance of water in the body.		discussion	practical tests, scientific reports
Week 4	3+2	Student understands bioenergy and its transformations.	Bioenergy and Its Conversions	Presentation, explanation, discussion	Oral, written, daily practical tests, scientific reports
Week 5	3+2	Student analyzes feed.	Feed Analysis	Presentation, explanation, discussion	Oral, written, daily practical tests, scientific reports
Week 6	3+2	Student understands enzyme functions.	Enzymes	Presentation, explanation, discussion	Oral, written, daily practical tests, scientific reports
Week 7	3+2	Student understands the digestion process.	Digestion Processes in Animals	Presentation, explanation, discussion	Oral, written, daily practical tests, scientific reports
Week 8	—	**Midterm Exam**	—	—	—
Week 9	3+2	Student learns about vitamins.	Vitamins	Presentation, explanation, discussion	Oral, written, daily practical tests, scientific reports
Week 10	3+2	Student understands carbohydrate metabolism.	Carbohydrates and Their Metabolism	Presentation, explanation, discussion	Oral, written, daily practical tests, scientific reports
Week 11	3+2	Student learns about types of proteins.	Proteins	Presentation, explanation, discussion	Oral, written, daily practical tests,

					scientific reports
Week 12	3+2	Student differentiates between protein digestion in ruminants and non-ruminants.	Protein Digestion in Non-Ruminants	Presentation, explanation, discussion	Oral, written, daily practical tests, scientific reports
Week 13	3+2	Student learns about fats.	Fats	Presentation, explanation, discussion	Oral, written, daily practical tests, scientific reports
Week 14	3+2	Student analyzes feed materials in the lab.	Laboratory Estimation of Feed Components	Presentation, explanation, discussion	Oral, written, daily practical tests, scientific reports
Week 15	—	**Final Exam**	—	—	—

11. Course Evaluation

Assessment Item	Frequency / Number	Weight (%)	Week
Quizzes	2	10%	Weeks 3 & 9
Lab Projects	1	10%	Weeks 4 & 11
Assignments	2	10%	Ongoing
Reports	1	10%	Week 12
Midterm Exam	2 hours	10%	Week 8
Final Exam	3 hours	50%	Week 15
Total Assessment	—	**100%**	—

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Available
Main references (sources)	Ruminant Nutrition
Recommended books and references (scientific journals, reports…)	*Principles of Animal Nutrition*

Course Description Form

1. Course Name:
Animal production techniques
2. Course Code:
Veterinary Pharmacology and Toxicology / ANP٣٠٢
3. Semester / Year:
Second / 2024-2025
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
My presence
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours/ Number of Units(2)
7. Course administrator's name (mention all, if more than one name)
Name: Ghassan Fathi Muhammad Email: ghassanalubaidy1961@ntu.edu.iq
8. Course Objectives
Course Objectives 1- To prepare the student to handle and use medications effectively and safely 2- To understand the principles of pharmacokinetics. 3- To develop therapeutic skills and clinical application. To understand toxicology.
9. Teaching and Learning Strategies

A- Knowledge	A1-The student will understand veterinary pharmacology in terms of general principles, classification of major drugs, and their application in the field of livestock. A2-The student will be familiar with veterinary toxicology techniques, which include (common toxins in the agricultural environment, diagnosis and treatment, and preventive aspects). A3-The student will analyze practical and applied aspects, which include (legal obligations, antibiotic resistance, risk assessment)..
B – Skills	- The student will acquire technical and practical skills, including (accurately calculating medication doses, managing group therapy, implementing withdrawal periods, and dealing with emergency poisoning cases). 2 - Possess diagnostic and analytical skills, including (reading laboratory test results, evaluating the quality of pharmaceutical preparations, and diagnosing drug interactions).
C- Values	3 - Implement prevention and management skills. 4 - Acquire occupational safety skills. ١- Ensuring food chain safety and ensuring that animal products (meat, dairy, eggs) are free of drug residues or toxins, protecting consumer health, and strictly adhering to .and documenting drug withdrawal periods ٢- Public health and preventing the transmission of resistant microbes-antibiotic ٣- Animal welfare ٤- Environmental sustainability

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	١theoretical + 3 practical	Familiarity with the basics of pharmacology	Introduction to Pharmacology	Introductory lecture and discussions about the curriculum	Brainstorming
2	١ theoretical + 3 practical	Study of the functions of the	Fundamentals of Pharmacology	Presentation, explanation, questions and	Quiz Exam

		body's organs and the mechanism of action of various drugs on them		answers, discussion	
3	١ theoretical + 3 practical	The student's knowledge of how to calculate doses and prescribe medication accurately	Study of the functions of the body's organs and the mechanism of action of various drugs on them	Presentation, explanation, questions and answers, discussion	Homework
4	١ theoretical + 3 practical	Animal handling skills and methods of giving them medication	How to calculate doses and prescribe medication accurately	Presentation, explanation, questions and answers, discussion	Quiz Exam
5	١ theoretical + 3 practical	Knowing the drug interactions and side effects of each drug and how to deal with it	Pharmacokinetics	Presentation, explanation, questions and answers, discussion	Homework
6	١ theoretical + 3 practical	Evaluate the factors influencing drug response and characterize .their action	Drug dynamics	Presentation, explanation, questions and answers, discussion	brainstorming
7	١ theoretical + 3 practical	The effect of metabolic processes on drug efficacy and toxicity	Drug metabolism	Presentation, explanation, questions and answers, discussion	Homework
8	١ theoretical + 3 practical	The effect of the drug at the molecular,	Mechanism of action of the drug	Presentation, explanation, questions and answers, discussion	Quiz Exam

		cellular and tissue levels to induce a biological .response			
9	١ theoretical + 3 practical	Toxicokinetics, Toxic Dynamics	Side effects of medications	Presentation, explanation, questions and answers, discussion	Homework
10	١ theoretical + 3 practical	on the Effect sympathetic and parasympathetic nervous systems, their mechanisms of action and veterinary uses	Autonomic nervous system medications	Presentation, explanation, questions and answers, discussion	Quiz Exam
11	١ theoretical + 3 practical	The effect of drugs on brain and spinal cord functions and their clinical uses in veterinary medicine	Central nervous system drugs	Presentation, explanation, questions and answers, discussion	Oral questions and answers
12	١ theoretical + 3 practical	The use of laboratory animals in scientific research and pharmaceutical experiments, while ensuring the application of the principles of animal welfare and .biosafety	Laboratory Animal Technology and Handling	Presentation, explanation, questions and answers, discussion	Homework

13	1 theoretical + 3 practical	The student has sufficient experience to know the safety of medicines by calculating ED50, LD50 and TI.	Diagnostic aspects of toxicology	Presentation, explanation, questions and answers, discussion	Quiz Exam
14	1 theoretical + 3 practical	Familiarity with toxicology concepts and terminology Students have		Introductory lecture and discussions about the curriculum	Homework
15	1theoretical +3practical	experience in diagnosing poisoning cases and prescribing appropriate antidotes for each case.	drug poisoning	Presentation, explanation, questions and answers, discussion	brainstorming

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	unavailable
Main references (sources)	unavailable
Recommended books and references (scientific journals, reports…)	**Text book of veterinary pharmcology**
Electronic References, Websites	**Hand book of veterinary pharmcology**

Course Description Form

1. Course Name:
Fish Diseases
2. Course Code:
ANP 303
3. Semester / Year:
Semester 6 / Year 3
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hr. \ 5 Units
7. Course administrator's name (mention all, if more than one name)
Name: Yahya Natiq Mohammed Email: yahyanatiq2003@ntu.edu.iq
8. Course Objectives
1. Understanding fishs diseases: The study of diseases that can be transmitted between fishs. **2. Identifying diseases: Identifying types of fishs diseases, such as bacterial, viral, a parasitic diseases.** **3. Studying biological pathogens: Understanding the biological basis of these diseases.** **4. Transmission Methods: Study the ways diseases are transmitted between fishs, a between susceptible one.** **5. Understanding the Health Impact: Understand the health impact of these diseases fishs.** **6. Diagnosis and Treatment: Study the methods of diagnosing and treating these diseases.** **7. Prevention and Control: Learn strategies for preventing and controlling these diseases.**
9. Teaching and Learning Strategies
1. Problem-based learning: Using real-life problems to promote critical thinking and learning. 2. Cooperative learning: Encouraging teamwork and collaboration among students. 3. Field visits: Organizing field visits to health or veterinary centers.

4. Self-directed learning: Encouraging students to engage in independent learning and research.
5. Project-based learning: Encouraging students to work on research projects.
6. Learning through Discussion: Encourage students to participate in discussions and debates.
7. Continuous Assessment: Conduct ongoing assessments throughout the semester.
8. Self-Assessment: Encourage students to evaluate their performance and identify areas for improvement.
9. Additional Resources: Provide additional resources such as books and electronic references.
10. Summative Assessment: Conduct a final assessment at the end of the semester.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student learns about fish in general and the environment in which they live.	Introduction, Animal Relationships, Classification of Animal Relationships, Animal Diseases	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student learns about fish enemies.	Fish Enemies: 1. Coelenterates - 2. Constrictors - 3. Crustaceans - 4. Aquatic Insects	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student learns about fish's response to disease.	Effect of Diseases on Fish Growth (Fish Response)	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student learns about attachment and feeding adaptations.	Adaptations: Fixation and Feeding Adaptations, Reduction or Absence of Organs	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
5	5	The student learns about the symptoms of fish disease.	Symptoms of Disease in Fish: Fish Behavior, Fish Color	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	Students learn about environmental diseases, nutritional deficiencies, and treatment methods.	Environmental diseases, nutritional deficiencies, treatment methods.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	Students learn about bacterial diseases.	Bacterial diseases: Introduction, rash disease, fish tuberculosis, dropsy disease.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

8	5	Students learn about viral diseases.	Viral diseases: Introduction, smallpox, viral hemorrhagic fever.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	Students learn about fungal diseases.	Fungal diseases: Introduction, control of fungal diseases, prevention, treatment.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	Students learn about primary diseases.	Primary (parasitic) diseases: Introduction, sarcomas.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	The student learns about primary disease control.	Ciliates: Primary Disease Control, Prevention, and Treatment	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student learns about flatworms that infect fish.	Fish Flatworms: Flukes	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student learns about the class of tapeworms, control of flatworm diseases, prevention, and treatment.	Tapeworms: Control of Flatworm Diseases, Prevention, and Treatment	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student learns about nematode diseases.	Nematode Diseases: Life Cycle and Disease Control	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student learns about diseases of annelids and crustaceans.	Diseases of annelids and crustaceans: 1. Polychaetes - 2. Oligochetes - Control of annelids and crustaceans	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books any)	No curricular books
Main references (sources)	كتاب انتاج و رعاية و امراض الاسماك المؤلف صلاح الدين محمد حسن العياط تاريخ النشر ٢٠٠٦ الطبعة الاولى
Recommended books and references (scientific journals, reports…)	Fish Disease: Diagnosis and Treatment Author(s): Edward J. Noga M.S., D.V.M., First published:18 June 2010 Print ISBN:9780813806976 |Online

	ISBN:9781118786758 |DOI:10.1002/9781118786758 Copyright © 2010 by Blackwell Publishing, Inc.
Electronic References, Websites	https://www.youtube.com/watch?v=PDOEHFB2uKE

Course Description Form

1. Course Name:
Animal production techniques
2. Course Code:
Fish farming and production / ANP304
3. Semester / Year:
Second / 2024-2025
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
My presence
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hours/ Number of Units(٣)
7. Course administrator's name (mention all, if more than one name)
Name: AbdulRhman B. Al-Hamdani Email: abdalrahman.ba.aw@ntu.edu.iq
8. Course Objectives
Course Objectives - The student will understand fish biology (anatomy, physiology, reproduction). - Understand water quality factors (oxygen, temperature, ammonia, pH) and their impact on fish growth. - Know aquatic ecosystems and the requirements of farmed species. - Learn artificial propagation techniques (inducing spawning, egg collection, and larval hatching). - Acquire skills in managing the rearing stages (nurseries, fattening, feeding, and vaccination). - Have knowledge of the design of aquaculture systems (earthen ponds, tanks, and floating cages). - Apply the principles of optimal nutrition (feed selection and feeding schedules). - Be able to identify the risk of infection and prevent and diagnose diseases and parasites. - Analyze the feasibility of projects (costs, profitability, and risk management). - Understand the environmental impact of aquaculture and adopt sustainable

practices.
- Conduct field visits to fish farms and hatchery centers.
- The student should be able to establish and manage a fish farm, achieve high productivity while reducing waste, and contribute to food security and supporting the economy through sustainable projects.

9. Teaching and Learning Strategies

A– Knowledge	A1 - Understand fish biology (anatomy, physiology, reproduction). A2 - Understand water quality factors (oxygen, temperature, ammonia, pH) and their impact on fish growth. A3 - Gain knowledge of aquatic ecosystems and the requirements of farmed species. A4 - The student will be able to establish and manage a fish farm.
B – Skills	1- Acquire technical skills in operating artificial breeding and hatchery systems, nutrition, and health. 2. Apply operational management skills in controlling environmental conditions, managing harvest and handling, and preventing risks. 3. Implement analytical and planning skills in economic feasibility analysis and environmental impact assessment. 4. Plan innovation skills by integrating modern technologies such as artificial intelligence systems and the use of renewable energy.
C- Values	1- Professionalism in animal handling 2- Sustainability as a central value (because it is the essence of modern agriculture) 3- Animal welfare 4- Teamwork in the production environment

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2theoretical + 3 practical	Acquire knowledge and skills	Introduction to fish farming and production	Introductory lecture and discussions about the	Brainstorming

				curriculum	
2	2 theoretical + 3 practical	Student knowledge of the types of water and fish suitable for living in it	Aquaculture	Presentation, explanation, questions and answers, discussion	Quiz Exam
3	2 theoretical + 3 practical	Countries rely on meeting more than 50% of their daily animal protein requirements.	The importance and advantages of fish farming	Presentation, explanation, questions and answers, discussion	Homework
4	2 theoretical + 3 practical	Production methods for fish farms	Possibility of increasing fish production	Presentation, explanation, questions and answers, discussion	Quiz Exam
5	2 theoretical + 3 practical	Artificial and natural reproduction in fish	Methods used in fish propagation	Presentation, explanation, questions and answers, discussion	Homework
6	2 theoretical + 3 practical	Explanation of the mechanism for creating a hatchery	hatchery equipment	Presentation, explanation, questions and answers, discussion	brainstorming
7	2 theoretical + 3 practical	Methods of reproduction in fish	Characteristics of carp mothers prepared for breeding	Presentation, explanation, questions and answers, discussion	Homework
8	2 theoretical + 3 practical	Determine standards or criteria to raise production efficiency	Systems followed in fish farming and production	Presentation, explanation, questions and answers, discussion	Quiz Exam
9	2 theoretical + 3 practical	Balance of dissolved oxygen with other environmental factors	Rules for choosing the location of fences	Presentation, explanation, questions and answers, discussion	Homework
10	2 theoretical + 3 practical	Integration of agriculture with ducks or geese	Mixed fish farming	Presentation, explanation, questions and answers, discussion	Quiz Exam
11	2 theoretical + 3 practical	The most common systems in fish farming	Fish farming in tanks or cages	Presentation, explanation, questions and answers, discussion	Oral questions and answers
12	2 theoretical + 3 practical	Environmental factors on which cage construction	Cage breeding requirements	Presentation, explanation, questions and	Homework

		depends		**answers, discussion**	
13	**2 theoretical + 3 practical**	**Pituitary gland and reproductive hormones**	**Reproduction in fish**	**Presentation, explanation, questions and answers, discussion**	**Quiz Exam**
14	**2 theoretical + 3 practical**	**Understanding management in reducing losses and increasing growth rates**	**Biological success of cage farming**	**Introductory lecture and discussions about the curriculum**	**Homework**
15	**2theoretical +3practical**	**Dobsch method, Hoover method, and hatchery method**	**Natural reproduction methods**	**Presentation, explanation, questions and answers, discussion**	**brainstorming**

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	unavailable
Main references (sources)	Fish Breeding and Production (Pr Dr. Nidal Mahmoud, Prof. Dr.Mahmo Ahmed Mohammed)
Recommended books and references (scientific journals, reports…)	unavailable
Electronic References, Websites	unavailable

Course Description Form

1. Course Name:
Poultry physiology
2. Course Code:
ANP 305
3. Semester / Year:
yearly
4. Description Preparation Date:
2025/7/17
5. Available Attendance Forms:
Weekly attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hours/3
7. Course administrator's name (mention all, if more than one name)
Name: As. Pr. Dr. Azhar Majid Ibrahim Email: dr.azharm@ntu.edu.iq
8. Course Objectives

Course Objectives The cognitive objectives for the poultry physiology lesson focus on enabling students to understand the vital functions of chickens and other poultry production birds in a scientific and systematic manner. Here are the most important cognitive objectives, systematically classified according to cognitive levels	• **Knowledge**….. • **Comprehension**….. • **Application**…..

9. Teaching and Learning Strategies	
Strategy	The subject takes into account the nature of the subject as an applied scientific subject, combining theoretical and practical aspects, using a combination of strategies that develop deep understanding, applied skills, and analytical thinking among students

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
		Understanding	The concept of	Lectures	exam

1	5	basic biological processes	physiology	& presentation	
2	5	Knowledge and understanding of the basic components of a cell	Cell structure and physiology	Questions and Answers, Discussion	Submitting research proposals
3	5	Distinguish the functional characteristics of each tissue type	Tissue structure and physiology	Interactive lecture	Diagnosis of body tissues is a brief
4	5	Explanation of the main physiological functions of the digestive system	Physiology of the digestive system	Interactive lecture, Anatomy of the Digestive System	Short tests
5	5	Explanation of the functional structure of the heart and blood vessels	Physiology of the circulatory system	Lecture, practical training	Submit a report on a field experiment
6	5	Explaining the relationship between cardiac output and blood pressure	Physiology of the circulatory system	Anatomy of the circulatory system	Short tests
7	5	Explaining the physiological structure of the respiratory system and explaining the mechanism of gas exchange	Physiology of the respiratory system	Interactive lecture, group discussions	Submit a report, short tests
8	5	Knowing and understanding the	Physiology of the urinary system	teractive lecture	Short tests

		physiological structure of the urinary system			
9	5	Understanding and recognizing the physiological structure of the male reproductive system	Physiology of the male reproductive system	Lecture, practical training	Short tests
10	5	Knowing and understanding the physiological structure of the female reproductive system	Physiology of the female reproductive system	Lecture, group discussions	bmit a report, short tests
11	5	A general explanation of the endocrine glands and their vital functions	Physiology of endocrine glands and hormones	Lecture, group discussions	Write a report
12	5	Analyzing the relationship between hormones and target organ functions	Physiology of endocrine glands and hormones	Case study	short tests
13	5	Explaining the concept of heat stress	Physiology of heat stress	teractive lecture	Submit a search
14	5	Description of the physiological adaptation mechanisms of poultry to environmental	Environmental physiology	teractive lecture	short tests

		changes			
15	5	Proposing management strategies and solving problems	A visit to one of the productive poultry farms	Practical training	short tests

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Animal physiology for dr. dyaa al-hasany
Main references (sources)	Physiology of domestic birds for dr. dyaa al-hasani
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Animal diseases
2. Course Code:
ANP 306
3. Semester / Year:
Semester 3 / Year 2
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hr. \ 3Units
7. Course administrator's name (mention all, if more than one name)
Name: Yahya Natiq Mohammed Email: yahyanatiq2003@ntu.edu.iq
8. Course Objectives
1. Understanding Animal diseases: The study of diseases that can be transmitted between animals. **2. Identifying diseases: Identifying types of Animal diseases, such as bacterial, viral, and parasitic diseases.** **3. Studying biological pathogens: Understanding the biological basis of these diseases.** **4. Transmission Methods: Study the ways diseases are transmitted between animals, and between susceptible animals.** **5. Understanding the Health Impact: Understand the health impact of these diseases on animals.** **6. Diagnosis and Treatment: Study the methods of diagnosing and treating these diseases.** **7. Prevention and Control: Learn strategies for preventing and controlling these diseases.**
9. Teaching and Learning Strategies
1. Problem-based learning: Using real-life problems to promote critical thinking and learning. 2. Cooperative learning: Encouraging teamwork and collaboration among students.

3. Field visits: Organizing field visits to health or veterinary centers.
4. Self-directed learning: Encouraging students to engage in independent learning and research.
5. Project-based learning: Encouraging students to work on research projects.
6. Learning through Discussion: Encourage students to participate in discussions and debates.
7. Continuous Assessment: Conduct ongoing assessments throughout the semester.
8. Self-Assessment: Encourage students to evaluate their performance and identify areas for improvement.
9. Additional Resources: Provide additional resources such as books and electronic references.
10. Summative Assessment: Conduct a final assessment at the end of the semester.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student learns about animal diseases.	Definition of disease, classification of diseases, methods of transmission, and control.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student learns about internal diseases.	Internal diseases.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student learns about the importance of respiratory diseases.	Respiratory diseases.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student can identify diseases of the urinary system.	Urinary system diseases.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
5	5	The student can classify metabolic diseases.	Metabolic diseases.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	The student can classify infectious diseases.	Infectious diseases.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	The student can identify the signs of anthrax.	Anthrax and hemorrhagic septicemia.	Presentation, explanation, questions and	Oral, written and daily practical tests and scientific

				answers, discussion	reports
8	5	The student can identify the signs of tuberculosis.	Tetanus, foot rot, tuberculosis, and pseudotuberculosis.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	The student will learn the details of some viral diseases.	Viral diseases.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	The student will learn about diseases that cause miscarriage.	Diseases that cause abortion.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	The student will learn the details of mastitis.	Mastitis.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student learns about a range of skin diseases.	Dermatitis.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student learns about a range of parasitic diseases.	Parasitic diseases.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student learns about a range of diseases caused by parasitic protozoa.	Protozoal diseases.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student learns about the most important equine diseases.	Equine diseases.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	No curricular books
Main references (sources)	Veterinary medicine (A text book of the diseases of cattle, sheep, pigs, goats and Horses) تاليف : **Radostitis,** O. M., Gay, C. C., Blood, D. C., Hinchcliff, K. W. and Constable, P.D.
Recommended books and references	Veterinary medicine (A text book of the

(scientific journals, reports…)	diseases of cattle, sheep, pigs, goats and Horses) تاليف : **Radostitis,** O. M., Gay, C. C., Blood, D. C., Hinchcliff, K. W. and Constable, P.D.
Electronic References, Websites	**https://www.vet-library.info/veterinary-medicine-books**

Course Description Form

1. Course Name:
Northern Technical University / Technical Agricultural College
2. Course Code:
Poultry Nutrition / ANP 307
3. Semester / Year:
Semester
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 / 3
7. Course administrator's name (mention all, if more than one name)
Name: Ameen Raaed Ali Email: ameen.r.ali@ntu.edu.iq
8. Course Objectives

Course Objectives	**• Understand the nutritional requirements of poultry at various stages of growth and production.** **• Identify the nutritional components of feed and their impact on bird health and production.** **• Study the physiological processes associated with digestion, absorption, and metabolism in birds.** **• Analyze the impact of environmental and genetic factors on feed efficiency and production.**

9. Teaching and Learning Strategies	
Strategy	Course Outcomes Definition: A set of knowledge, skills, and values that a course seeks to achieve in students. Importance: It provides the learner with a clear idea of what they will be able to do after completing the course, and it helps

	in designing and evaluating courses. How They Are Determined: Course outcomes are determined based on the objectives of the academic program to which the course belongs.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student should understand the concept of nutrition.	Nutrition and the Functions of Nutrients in the Bird's Body	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student should understand energy and its forms.	The Concept of Energy, Its Forms, and Fate in the Bird's Body	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student should know proteins, their forms, and their benefits.	Proteins	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student should distinguish the factors affecting proteins.	Factors Affecting Protein Needs	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student should understand the digestive processes.	Digestibility of Nutrients	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	The student should understand the effects of nutrition on production.	The Effect of Nutrition on Production Quality	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	The student should distinguish the water needs of poultry.	Water Needs of Poultry	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	The student should know the physiology of birds to overcome high temperatures.	Feeding Poultry in Hot Regions	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	The student should know the symptoms associated with malnutrition and poisoning.	Malnutrition and Feed Poisoning	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	The student should distinguish between feed	The Nature of Feedstuffs Used in Poultry Feeding	Presentation, explanation,	Oral, written and daily practical

		materials.		questions and answers, discussion	tests and scientific reports
11	5	The student should be able to calculate the energy needs of poultry.	Calculating Nutritional Energy Needs	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student should be able to calculate the protein needs of poultry.	Calculating Daily Protein Needs of Poultry	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student should be able to calculate the protein needs of poultry.	Calculating Daily Protein Needs of Poultry	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student should be able to formulate balanced rations.	Formulating and Mixing Feed	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student should understand the concept of nutrition.	Methods of Formulating and Mixing Feeds	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Poultry Nutrition Basics, Dr. Ismail Khalil Ibrahim
Recommended books and references (scientific journals, reports…)	Poultry Nutrition, Vincenzo Tufarelli
Electronic References, Websites	(arabicpoultryedu.com)

Course Description Form

1. Course Name:	
Meat technology and marketing	
2. Course Code:	
ANP308	
3. Semester / Year:	
Semester	
4. Description Preparation Date:	
17/7/2025	
5. Available Attendance Forms:	
Attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
75 / 3	
7. Course administrator's name (mention all, if more than one name)	
Name: Mohammed Waad Mohammed Email: mohammed.waad88@ntu.edu.iq	
8. Course Objectives	
Course Objectives	**• Provide students with basic knowledge about meat varieties.** **• Learn about the latest technologies used in meat farm management.** **• Analyze the impact of nutrition and breeding on the quality of meat produced.** **• Use modern technologies to improve production.**
9. Teaching and Learning Strategies	
Strategy	Course Outcomes Definition: A set of knowledge, skills, and values that a course seeks to achieve in students. Importance: It provides the learner with a clear idea of what they will be able to do after completing the course, and it helps in designing and evaluating courses. How They Are Determined: Course outcomes are determined based on the objectives of the academic program to which the

	course belongs.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student should know the concept of meat science.	Introduction to meat science	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	Meat production	Conditions to be considered when establishing meat production farms and slaughterhouses	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The biological importance of meat production	The importance of meat for the human body	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will understand the types meat.	Origin and Classification of Poultry	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	Classification of types of meat	Carcass cuts	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
5	5	Per capita share of domestic production	Total share per person	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	Meat production patterns	Environmental factors affecting meat production	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	Definition of marketing	Marketing science	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	Modern technologies in production and marketing systems	Modern marketing technologies	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	Marketing issues	Marketing problems	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	Marketing types	Marketing channels	Presentation,	Oral, written and

		illustrative program		explanation, questions and answers, discussion	daily practical tests and scientific reports
11	5	Animal transport and animal transport vehicles	Means of transportation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	Growth and development of meat animals	Changes in carcass components	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	Changes in the proportions of carcass components	Carcass components ratios	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	Optimal investment for efficient meat production	Meat production efficiency	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
١٥	٥	Environment and management	Environment and management for meat animals	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	• Primary sources: Lectures by Asst. Prof. Dr. Amira Mohammed Saleh Al-Rubaie / University of Baghdad, College of Agricultural Engineering Sciences • Book of meat production /ghon ewart
Recommended books and references (scientific journals, reports…)	• Al-Taie, Munir Abboud and Al-Moussawi, Umm Al-Bashar Hamid Jaber (1992). Practical Meat and Fish Technology. College of Agriculture, University of Basra, 142 pages. • Al-Shareek, Youssef Mohammed (2005). Meat Technology. Al-Fateh University Publications, Tripoli, Libya, 376 pages. • Al-Afandy, Salah Mahmoud Youssef (2012). Meat Health and Safety, General Authority for Export and Import Control, Arab Republic of Egypt, 100 pages.
Electronic References, Websites	Meat production and processing on wekibidia Wekipedia.org

Course Description Form

1 .Course Title:
Animal Breeding and Improvement
2. Course Code:
ANP309
3.Level / Academic Year:
Fourth Year / 2024–2025
4.Date of Description Preparation:
17/07/2025
5. Available Attendance Modes:
In-person
6. Total Credit Hours / Units:
60 hours (1 theoretical + 3 practical) × 15 weeks/3
7.Course Coordinator (All names if multiple):
Name: Haneen Mowfak Ahmed Email: Haneen.mowfak@ntu.edu.iq
8. Course Objectives:
• Understand the methods of breeding and improvement of farm animals. • Gain knowledge about ways to enhance animal productivity in terms of meat and milk. • Learn about the history and development of animal breeding and improvement sciences, including theories of evolution. • Understand selection methods and tools. • Enhance student skills regarding methods of increasing agricultural animal productivity.
9. Teaching and Learning Strategies:
• Discussion and dialogue strategy • Brainstorming • Self-learning • Group collaborative assignments • Report writing task
10.Course Structure:

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	4 Hours (1Theory+3 3 Practical)	Theory: A1. Understand statistical principles related to animal breeding including significance tests and analysis of variance. Practical: A1. Recall and understand statistical calculations related to animal breeding and improvement.	Theory: Principles of statistical operations in animal breeding. Practical: Measures of dispersion and central tendency	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports.
2	4 Hours (1Theory+3 3 Practical	Theory: B1. Explain major gene expression patterns and gene types. Practical: A2. Understand regression and correlation coefficients	Theory: Gene expression patterns and genetic principles in breeding. Practical: Measures of correlation and regression	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports.
3	4 Hours (1Theory+3 3 Practical	Theory: A3. Explain gene frequency in the case of single or multiple gene pairs. Practical: C3. Apply calculations of gene and allele frequencies.	Theory: Gene frequency and mating types. Practical: Understanding gene frequency and calculation of genetic compositions	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
4	4 Hours (1Theory+3 3 Practical	Theory: A4. Identify factors affecting gene frequency such as drift, migration, mutation, andselection. Practical: C3. Apply calculations for gene frequency and analyze influencing factors.	Theory: Factors affecting gene frequency. Practical: Application of gene frequency and its influencing factors.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
5	4 Hours (1Theory+3 3 Practical	Theory: A4. Explain the relationship between reproduction and breeding. Practical: C4. Measure reproductive traits.	Theory: Reproduction and its rates in animals. Practical: Reproduction and its rates in animals.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
6	4 Hours (1Theory+3 3 Practical	Theory: A5. Differentiate between types of selection. Practical: C5. Analyze selectiondata. B2. Collaborate in group work.	Theory: Types of selection - natural and artificial. Practical: Types of selection	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
7	4 Hours (1Theory+3 3 Practical	Theory: A6. Explain the concept of heritability and relationship among relatives. Practical: C4. Use and apply heritability rates and kinship formulas	Theory: Heritability, variance analysis, and relationships among relatives. Practical: Variance analysis and kinship.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports

8	4 Hours (1Theory+3 3 Practical	Evaluate.student comprehension	First Midterm Exam (Theory).	Presentation, explanation, Q&A, interactive discussion, self-learning.	Written examination
9	4 Hours (1Theory+3 3 Practical	Theory: B3. Explain breeding based on genetic and phenotypic similarity. Practical: C4. Calculate inbreeding and outbreeding coefficients.	Theory: Types of breeding (inbreeding, outbreeding, line breeding). Practical: Types of breeding.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
10	4 Hours (1Theory+3 3 Practical	Theory: A3. Understand main types of crossbreeding. Practical: C2. Evaluate improvement rates.	Theory: Types of crossbreeding. Practical: Hardy-Weinberg Law.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
11	4 Hours (1Theory+3 3 Practical	Theory: C6. Define genetic equivalence and genetic parameters. Practical: C5. Write and interpret a report on genetic equivalence and parameters.	Theory:Genetic parameters in animal herds. Practical:Genetic equivalence	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
12	4 Hours (1Theory+3 3 Practical	Theory: C7. Explain calculation of repeatability. Practical: C6. Calculate repeatability coefficient.	Theory: Repeatability and its purpose. Practical: Method of calculating repeatability	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
13	4 Hours (1Theory+3 3 Practical	Evaluate.student comprehension	Second Midterm Exam (Practical).	Presentation, explanation, Q&A, interactive discussion, self-learning.	Written examination
14	4 Hours (1Theory+3 3 Practical	Theory: B2. Explain the concept of selection intensity and genetic correlation. Practical: C7. Calculate genetic correlation and selection intensity.	Theory: Genetic correlation, selection intensity, and genetic selection. Practical: Genetic correlation and its calculation	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
15	4 Hours (1Theory+3 3 Practical	Theory: B6. Explain animal records and modern approaches in animal breeding and improvement. Practical: C8. Present a proposed project	Theory:Animal records and improvement projects in.Iraq. Practical: Animal records	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports

11.Course Evaluation

Grade distribution out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral tests, monthly or written exams, reports, etc

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Animal Breeding by Salah Jalal and Hassan Karam Principles of Animal Genetics and Breeding by Maher Hasab Al-Nabi Khalil
Electronic References, Websites	Animal Breeding and Genetics for BSc Students

Course Description Form

1. Course Name:
Animal Production Machinery
2. Course Code:
ANP 351
3. Semester / Year:
Second / 2024-2025
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
My presence
6. Number of Credit Hours (Total) / Number of Units (Total)
75hours/3 units
7. Course administrator's name (mention all, if more than one name)
Name: Yahya Younis Mohsin AL-Obaidi Email: Mti.lec176.yahya@ntu.edu.iq
8. Course Objectives
The main objective of the animal production machine is to introduce the student to the general concept of production mechanization, encourage him to understand the importance of using other parts in the various production processes, develop the student's skills in dealing with this feature, and accept the student to be in the development of the agricultural sector through the use of technology in production.
9. Teaching and Learning Strategies

A-Knowledge	A- Knowledge • 1- The ability to understand and apply mechanical principles in animal production: This includes understanding the principles of nutrition, care, micromanagement, and various uses in production. • 2- The ability to use modern technologies in animal production: such as the use of gynecological monitoring techniques in the breeding environment, new equipment and machinery in healthy nutrition, and targeted applications of artificial innovation in production. • 3- The ability to conduct production analysis: This includes evaluating the quality of animal products, production efficiency, and estimating the economic benefits and other benefits of animal products.

	• The ability to develop and apply solutions to problems facing animal production: such as developing a new feeding system, new technologies in the field of health care, and promising production potentia
B - Skills	B - Skills • 1- Understanding Mechanical and Electrical Principles: This course aims to introduce students to the operating principles of equipment and machinery used in animal production, such as ventilation, cooling, heating, irrigation systems, and milking equipment. • 2- Selecting Appropriate Equipment: Students are trained to select the appropriate equipment and machinery for each type of animal production, taking into account environmental conditions and the specific needs of the animals. • 3- Using Equipment Skillfully: Students are trained on how to use equipment and machinery skillfully and efficiently, including installation, operation, and necessary preventive and maintenance. • 4- Managing Integrated Agricultural Projects: This course aims to enable students to manage integrated agricultural projects, utilizing modern technology in production planning, costing, quality control, and product marketing. • 5- Solving Technical Problems: Students are trained to identify and effectively solve technical problems that may arise in equipment and machinery.
C- Values	C- Values 1- Professionalism in handling agricultural machinery and equipment 2- Sustainability in managing agricultural resources 3- Training workers and encouraging trainees to work in the field of agricultural mechanization, encouraging them to work together to boost the economy and increase productivity.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**2 theoretical + 3 practical**	**Agricultural buildings used for animal production and how to construct them**	**Conditions that must be followed when designing agricultural buildings**	**Introductory lecture and discussions about the curriculum**	**Homework**
2	**2 theoretical + 3 practical**	**Controlling environmental conditions**	**Mechanism to control**	**Presentation, explanation,**	**Quiz Exam**

		inside animal pens	**temperature, humidity, and ventilation for barns**	**questions and answers, discussion**	
3	**2 theoretical + 3 practical**	**Providing water to animal pens for daily consumption and storage**	**Components of the water supply network**	**Presentation, explanation, questions and answers, discussion**	**Report**
4	**2 theoretical + 3 practical**	**Pumps used in animal production, their types and sizes, and choosing the best one for the project**	**Pump maintenance, cleaning and installation**	**Presentation, explanation, questions and answers, discussion**	**Quiz Exam**
5	**2 theoretical + 3 practical**	**Agricultural tractors, their sizes and operating mechanisms**	**Teaching the student to drive agricultural tractors in the field**	**Presentation, explanation, questions and answers, discussion**	**Oral Questions and Answers**
6	**2 theoretical + 3 practical**	**Mechanisms for harvesting and collecting fodder in the field**	**Regulations for various types of conveyors**	**Presentation, explanation, questions and answers, discussion**	**Homework**
7	**2 theoretical + 3 practical**	**Mechanization of production and storage of gum as animal feed**	**Maintaining and adjusting feed baling and handling equipment before work**	**Presentation, explanation, questions and answers, discussion**	**Homework**
8	**2 theoretical + 3 practical**	**Exam**	**Preparing cows for automatic milking and maintaining the parlor**	**Presentation, explanation, questions and answers, discussion**	**Quiz Exam**
9	**2 theoretical + 3 practical**	**Automated milking equipment and systems**	**Transport vehicles, their types, and ways to connect them to agricultural tractors**	**Presentation, explanation, questions and answers, discussion**	**Report**
10	**2 theoretical + 3 practical**	**Mechanization of cleaning and disposal of animal waste**	**Grinders and feed mixers and their working mechanism**	**Presentation, explanation, questions and answers, discussion**	**Quiz Exam**
11	**2 theoretical + 3 practical**	**Technological methods for crushing fodder for animals**	**Cleaning, preparing and sterilizing the sheep before shearing the wool**	**Presentation, explanation, questions and answers, discussion**	**Oral Questions and Answers**
12	**2 theoretical + 3 practical**	**Mechanization of wool shearing for sheep**	**Visiting a model field for raising poultry and producing table**	**Presentation, explanation, questions and answers,**	**Homework**

			eggs and learning about the work of hatcheries	**discussion**	
13	**2 theoretical + 3 practical**	**Hatcheries and egg packing equipment**	**Visit to typical slaughterhouses and learn the correct methods of slaughtering animals**	**Presentation, explanation, questions and answers, discussion**	**Quiz Exam**
14	**2 theoretical + 3 practical**	**Animal slaughter equipment (sheep, cows)**	**Types of mechanical composting mechanisms for animal waste and how they work**	**Introductory lecture and discussions about the curriculum**	**Report**
15	**2 theoretical + 3 practical**	**How to benefit from animal waste and slaughterhouse waste as animal fertilizer that is beneficial to plants**	**Types of maintenance and storage of machinery**	**Presentation, explanation, questions and answers, discussion**	**Quiz Exam**

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Available**
Main references (sources)	**Animal Production Machinery Book / Dr. Muhammad Jassim Al-Nama**
Recommended books and references (scientific journals, reports…)	**Animal Production Machinery Book / Dr. Lutfi Hussein**
Electronic References, Websites	**Animal Production Machinery Suit, Mahmoud Hassan and Thamany Mu'ayy**

Course Description Form

1. Course Name:
Histology and Embryology
2. Course Code:
ANP 355
3. Semester / Year:
Semester
4. Description Preparation Date:
17/07/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 / 3
7. Course administrator's name (mention all, if more than one name)
Name: Email:
8. Course Objectives

Course Objectives	Understand the basic structure of animal tissues and distinguish between the major tissue types (epithelial, connective, muscle, and nervous) in terms of structure and function. • Analyze basic embryonic processes and the sequence of embryonic development from fertilization to organ formation, with an emphasis on embryonic morphology and symmetry. • Acquire microscopic examination skills and identify the characteristic features of tissues on pre-prepared microscope slides. • Relate histological changes to the functional manifestations of animal organs, and apply them to pathological understanding in abnormal conditions. • Develop the ability to draw and scientifically describe embryonic tissues and organs as part of laboratory practice. • Use histological and embryological

	information to understand the mechanisms of growth, reproduction, and biological differences between different animal species.

9. Teaching and Learning Strategies

Strategy	
	Course Outcomes Definition: A set of knowledge, skills, and values that a course seeks to achieve in students. Importance: It provides the learner with a clear idea of what they will be able to do after completing the course, and it helps in designing and evaluating courses. How They Are Determined: Course outcomes are determined based on the objectives of the academic program to which the course belongs.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4 Hours (1Theory+3 3 Practical)	Theoretical: 1. The student will understand histology and tissue types. Practical: 1. The student will remember and understand cell shapes.	Theoretical: Introduction to Histology, Epithelial Tissues. Practical: Animal Cell Shapes.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports.
2	4 Hours (1Theory+3 3 Practical	Theoretical: 1: To explain the most important connective tissues. Practical: 1: To enable the student to identify connective tissues.	Theoretical: Connective tissues (cartilage and bone). Practical: Diagnosing epithelial, simple, and multilayered tissues.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports.
3	4 Hours (1Theory+3 3 Practical	Theoretical: 1: The student explains blood and how it is formed. Practical: 1: The student identifies connective tissue.	Blood and bone marrow biopsy: Diagnosis of connective tissue (cartilage and bone)	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
3	4 Hours (1Theory+3 3 Practical	Theoretical: 1: The student explains the types of tissues and	Theoretical: Muscle tissue (skeletal muscle, smooth muscle,	Presentation, explanation, Q&A, interactive	Oral, written and practical daily assessments and scientific reports

		distinguishes between them. Practical: 1: The student performs a blood test and observes the red blood cells.	cardiac muscle) Practical: Blood, white and red blood cells, and methods of distinguishing between them	discussion, self-learning.	
4	4 Hours (1Theory+3 3 Practical	Theoretical: 1: The student will understand nervous tissue. Practical: 1: The student will identify muscle tissue.	Theoretical: Nerve tissue Practical: Diagnosing muscle tissue	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
6	4 Hours (1Theory+3 3 Practical	Theoretical: 1. The student will diagnose placental tissue and identify endocrine glands. Practical: 1. The student will diagnose nervous tissue.	Theoretical: Placental tissue and glands (endocrine glands) Practical: Diagnosing nervous tissue	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
7	4 Hours (1Theory+3 3 Practical	Theoretical: 1: Explain the tissues of the digestive system. Practical: 1: The student will be able to distinguish between the types of glands.	Theoretical: Digestive system tissues Practical: Identifying the types of glands	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
8	4 Hours (1Theory+3 3 Practical	Assessing student understanding	First semester exam	Presentation, explanation, Q&A, interactive discussion, self-learning.	Written examination
9	4 Hours (1Theory+3 3 Practical	Theoretical: 1: The student will know the sensory organs in animals. Practical: 1: The student will know the shapes of the cells in the digestive system and the function of each.	Theoretical: Sensory organs (eyes and ears) Practical: Observing the shapes and functions of cells in the digestive system	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
10	4 Hours (1Theory+3 3 Practical	Theoretical: 1: To become familiar with the most important components of the male and female reproductive systems and the functions of each. Practical:	Theoretical: Male and female reproductive systems Practical: Anatomy of the female and male reproductive systems	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports

		1: To observe the components of the reproductive system and identify its components.			
11	4 Hours (1Theory+3 3 Practical	Theoretical: 1: The student explains embryology and how gametes are formed. Practical: 1: The student distinguishes between the formation of sperm and eggs.	Theoretical: Introduction to embryology, gamete formation (egg and sperm) Practical: Observing the processes of egg and sperm formation	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
12	4 Hours (1Theory+3 3 Practical	Theoretical: 1: The student explains how fertilization occurs in animals. Practical: 1: The student understands internal and external fertilization.	Theoretical: Fertilization (poultry, mammals, fish) Practical: Applied study of external and internal fertilization	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
13	4 Hours (1Theory+3 3 Practical	Assessing student understanding	Second semester exam	Presentation, explanation, Q&A, interactive discussion, self-learning.	Written examination
14	4 Hours (1Theory+3 3 Practical	Theoretical: 1: Explain the concept of fission and blastocyst formation. 1: The student will understand the stages of embryonic development in animals.	Theoretical: Fission and blastocyst formation Practical: Embryonic development in poultry, fish, and mammals	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
15	4 Hours (1Theory+3 3 Practical	Theoretical: 1: Explain the stages of growth and the stages of differentiation and differentiation. Practical: 1: The student will summarize the embryonic development of different animals.	Theoretical: Growth phase and differentiation phase Practical: Embryonic development in poultry, fish, and mammals	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Principles of Histology book / written by Dr. Hamid Ahmed Hajj
Main references (sources)	Color Atlas of Histology , Leslie P. Gartner & James L. Hiatt
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	https://skylineistedu.com/ar/majors/histology-and-embryology

Course Description Form

1. Course Name:	
Scientific research methodology	
2. Course Code:	
NTU 401	
3. Semester / Year:	
Level 4 (Fourth Year) /2024 – 2025	
4. Description Preparation Date:	
17/7/2025	
5. Available Attendance Forms:	
Paper form including name, date of attendance and signature	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30/2	
7. Course administrator's name (mention all, if more than one name)	
Name: Asst. Prof. Dr. Fahad K. Y. Al-Dulaimi Email: fahadbiologymycology@ntu.edu.iq	
8. Course Objectives	
Course Objectives	By the end of the course, the student is expected to be able to: 1. Explain the concept of scientific research, its objectives, and its importance in solving scientific and applied problems. 2. Distinguish between different types of research and scientific methodologies, and select the appropriate methodology for their research topic. 3. Select and formulate a clear research problem, defining suitable objectives and hypotheses. 4. Search reliable scientific sources and references, and prepare a structured literature review. 5. Design a comprehensive scientific research plan according to sound methodological principles. 6. Select and practically apply the appropriate data collection tool. 7. Analyze data using appropriate statistical methods and analysis software.

	8. Discuss results, relate them to objectives and hypotheses, and provide practical, scientific recommendations. 9. Write the scientific research in correct academic style, adhering to research ethics and proper referencing. 10. Prepare a publishable research paper for submission to a peer-reviewed scientific journal and present it formally.

9. Teaching and Learning Strategies

Strategy	1. Interactive lectures 2. Project-based learning 3. Teamwork 4. Problem-based learning 5. Practical workshops 6. Presentations and classroom discussions 7. Blended e-learning

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The student should be able to explain the concept, importance, and characteristics of scientific research; distinguish between research and reports; and explain the role of scientific research in sustainable development.	**Introduction to Scientific Research:** Definition, importance, characteristics of good research, difference between research and reports, role of scientific research in sustainable development.	Interactive lecture + classroom discussion	Classroom participation and discussion

2	2	The student should classify types of scientific research (basic, applied, descriptive, experimental, analytical, case studies) and determine the use of each type.	**Types of Research:** Basic, applied, descriptive, experimental, analytical, and case studies.	Interactive lecture + practical examples	Daily short oral quiz
3	2	The student should explain how to select a research topic and clearly formulate the research problem, mentioning its key elements.	**Choosing a Research Topic and Formulating the Problem:** How to choose an appropriate topic, defining and formulating the research problem, components of the research problem.	Practical workshop + group activity	Group activity assessment (choosing a research topic)
4	2	The student should formulate precise research objectives, develop suitable hypotheses, and explain the difference between hypotheses and research	**Formulating Research Objectives and Hypotheses:** Precise formulation of research objectives, types of research hypotheses, difference between	Individual practical application + student discussion	Individual assignment (formulating objectives and hypotheses)

		questions.	hypotheses and research questions.		
5	2	The student should search various scientific sources (books, articles, theses) and use reference management tools like Mendeley.	**Scientific Sources:** Methods for searching scientific sources (books, articles, theses), using digital libraries, searching via Google Scholar, managing references using software like Mendeley.	Training on database searching + research assignment	Assignment for collecting and referencing sources
6	2	The student should analyze previous studies, identify research gaps, and write a structured literature review.	**Review of Previous Studies:** How to analyze previous studies, identify research gaps, and write a literature review.	Scientific article analysis + classroom discussion	Literature review summarization exercise
7	2	The student should choose the appropriate research methodology and apply different data collection tools according to research needs.	**Research Methodologies and Data Collection Tools:** Selecting the appropriate research methodology (descriptive, experimental, analytical), data collection tools (questionnaire,	Practical activity for designing data collection tools	Evaluation of student-prepared data collection tool

			interview, observation, experiments).		
8	2	The student should design a comprehensive research plan including objectives, hypotheses, methodology, tools, and a timeline.	**Designing the Research Plan:** Preparing the research plan (introduction, objectives, hypotheses, methodology, tools, timeline), writing and formatting it properly.	Research plan preparation workshop + feedback session	Preliminary evaluation of the research plan
9	2	The student should explain the concepts of population and sample, determine the appropriate sampling method, and calculate sample size.	**Population and Sampling:** Defining population and sample, sampling methods (random, stratified, purposive), calculating sample size and its impact on results.	Lecture + practical application on sampling	Short daily quiz on sampling and population
10	2	The student should use basic statistical analysis methods to present data using SPSS or Excel, with results displayed in tables and charts.	**Data Analysis and Results Presentation:** Statistical analysis methods, graphical representation, using SPSS and Excel, presenting results in tables and	Practical training using SPSS/Excel	Evaluation of mini data analysis report

			charts.		
11	2	The student should discuss results, relate them to previous studies, and formulate clear and applicable recommendations.	**Discussion of Results and Recommendations:** How to interpret results, relate them to previous studies, formulate conclusions and practical recommendations	Classroom discussion of real results + group activity	Activity for discussing results and recommendations
12	2	The student should write the scientific research report in standard academic format following its main components.	**Scientific Research Writing in Academic Format:** Structure of the research paper (title, abstract, introduction, methodology, results, discussion, recommendations, references), research ethics.	Research report writing workshop + review	Preliminary assessment of the written research draft
13	2	The student should prepare a publishable research paper, select an appropriate journal, recognize predatory journals, and explain	**Scientific Publishing in Peer-Reviewed Journals:** How to prepare a paper for publication, choosing the appropriate journal (Scopus, Web of	Specialized lecture on scientific publishing + analysis of published papers	Evaluation of a publishable research paper

		submission steps and dealing with reviewers.	Science), identifying predatory journals, submission process, handling reviewers' comments, authorship and intellectual property rights.		
14	2	The student should deliver a clear research presentation, participate in discussing and evaluating peers' presentations, and correct methodological and scientific errors.	**Student Research Presentations and Discussions**: Students present mini research projects, discuss their methodology and scientific content, correct common errors.	Student presentations + group discussions	Assessment of presentation and research project discussion
15	2	The student should demonstrate understanding of the course content by successfully passing the final exam.	**Final Evaluation**	Final exam	Final exam + final project evaluation
11. Course Evaluation					
(Grade out of 100) 1. Classroom participation and weekly activities: 10% 2. Individual and group assignments: 10%					

3. Periodic short quizzes (at least two): 10% 4. Research presentation and discussion: 10% 5. Final written exam: 60%

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Lectures on the Methodology and Philosophy of Scientific Research, Professor Dr. Iyad Youssef Al-Hajj Ismail, First Edition, 2019.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course name:	
design and analysis experiments	
2. Course code:	
TAMO 401	
3. Level/Academic Year:	
Fourth	
4. Description preparation date:	
17/7/2025	
5. Available attendance forms:	
A paper form that includes the student's name, date, and signature.	
6. Number of credit hours (total) / Number of units (total):	
60/2	
7. Name of course supervisor (mention all names if there are multiple supervisors):	
Name: Dr. Zahraa Abdel Rahman Sabry amyl:zahraa@ntu.edu.iq85	
8. Course objectives:	
Aims The decision to supply students With knowledge and skills necessary For design experiments Scientific Effective and analysis Its results Using Methods Statistics. **identification The student Importantly planning And implementation experiments agricultural How to Control by mistake experimental And study designs used in area experiments agricultural And it becomes The student able on planning And implementation Design and analysis His data.**	**Course objectives:**
9. Teaching and learning strategies:	
1- Interactive lecture 2- Brainstorming	Strategy:

3- Dialogue and discussion 4- Writing on the board 5- Adapting to tasks and reports	

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	watches	week
Test + Questions and Answers	Lecture + Presentation	Concepts Basic Most important Rules Basic in design and analysis experiments	1- That learn The student Concepts Basic Private By design experiments . 2-The student understands the basic rules of design. 3-The student should be familiar with all the terms related to design and analysis of experiments. 4-that learn The student Steps Followed in experiments.	4	1
Test + Questions and Answers + Exercise Solutions	Lecture + Presentation + Writing on the Board	Completely randomized design 1- Design features 2- Design defects 3- Analysis of variance	1- That He knows The student sources difference existing in Design 2- That understand The student How to Find table analysis Contrast 3-that can The student planning experience	4	2
Test + Questions and Answers + Exercise	Lecture + Presentation	Completely randomized design with unequal replications	1- The student should be able to identify the design, whether the repetitions are equal or unequal. 2-that He works The	4	3

Solutions			student on Continue in collection Views until Lost Most of them.		
Test + Questions and Answers + Exercise Solutions	Lecture + Presentation + Writing on the Board	design Sectors randomness Complete , conditions Use Design , Advantages Design , Its disadvantages , sources difference.	1- That recognize The student on design Sectors randomness 2-The student should know the sources of variation in design. 3-that understand The student How to application Design in experience. 4-that learn The student How to Find table analysis Contrast.	4	4
Test + Questions and Answers + Exercise Solutions	Lecture + Presentation	analysis Contrast , to set number duplicates , appreciation value The missing(or more)in Sectors	1- The student can find the missing value. 2-that can from analysis Results And its application Field.	4	5
Test + Questions and Answers + Exercise Solutions	Lecture + Presentation	design The square Latin , conditions Usage , features and defects Design.Analysis of variance	1-that recognize The student on design The square Latin. 2-The student should know the sources of variation in design. 3- The student understands how to apply the design in the experiment. 4-The student learns how to find an analysis of variance table.	4	6
Test +	Lecture +	efficiency design	knowledge The student	4	7

Questions and Answers + Exercise Solutions	Presentation	Sectors randomness Complete And design The square Latin	any designs more efficiency from The other		
	Lecture + Presentation	Sources of variation in the Latin square, analysis of variance, estimation of one or more missing values	The student learns how to find the missing value.	4	8
Test + Questions and Answers + Exercise Solutions	Lecture + Presentation	Diagnosis Moral Differences between Averages Arithmetic ,1- Comparisons Independent	-1 The student learns the testing method. - 2 The student should understand when the test is conducted, before or after the experiment. 3- The student should know when to use this test, when the factor is quantitative or qualitative. 4-The student should know the number of independent comparisons included in the experiment, how to conduct the test, and how to find the sum of squares of the coefficients and the sum of squares of the comparisons.	4	9
		2-analysis Trend	1-The student should	4	10

Test + Questions and Answers + Exercise Solutions	Lecture + Presentation	3-a test Duncan	understand when the test is conducted before or after the experiment, and when this test is used when the factor is quantitative or qualitative. 2-The student learns how to conduct an analysis of variance table.		
Test + Questions and Answers	Lecture + Presentation	experiments The global Factorial Experiments, their conditions, advantages and disadvantages,	1- The student should become familiar with the global experiences. 2-that learn The student Do that This is amazing experiments To study factor one or more from factor.	4	11
Test + Questions and Answers + Exercise Solutions	Lecture + Presentation	sources difference in experiments The global , analysis Contrast.	1- The student should know how to find an analysis of variance table. 2-that recognize The student on number Levels all factor.	4	12
Test + Questions and Answers + Exercise Solutions	Lecture + Presentation	design panels The infiltrator , Its conditions , Its features , Disadvantages.sources difference in experiments panels The infiltrator , analysis Contrast	1-The student will learn about the design of split panels. 2-The student learns how to find an analysis of variance table. 3-The student should know which factors are more important than the other. 4-can The student from	4	13 and 14

			to divide experience to Levels different.		
Test + Questions and Answers + Exercise Solutions	Lecture + Presentation	Regression analysis	1-The student understands the relationship between the dependent and independent variables. 2-The student understands the extent of the effect of each independent variable on the dependent variable. 3-that recognize The student on Types decline.	4	15

11. Course Evaluation:	
Ask questions + Discussion + Test + Exercises	
12. Learning and teaching resources:	
book design and analysis experiments	Required textbooks (curriculum books, if any)
	Main References (Sources)
Lectures and books published in Iraqi universities	Recommended books and references (scientific journals, reports...)
Sites specialized in designing and analyzing experiments	Electronic references, websites

Course Description Form

1. Course Name:
Agricultural Marketing
2. Course Code:
ANP 452
3. Semester / Year:
autumn
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
In-person attendance in the classroom
6. Number of Credit Hours (Total) / Number of Units (Total)
30/2
7. Course administrator's name (mention all, if more than one name)
Name: Doaa Qasim Sabri Email: dqasm0478@ntu.edu.iq

8. Course Objectives

Course Objectives	• Understand the role of marketing in agribusiness Recognize marketing as a key economic activity and its significance for national development studocu.com+2studocu.com+2scribd.com+2scribd.com. • Learn core marketing concepts and functions Identify and explain marketing functions such as assembling, grading, packaging, storage, transportation, distribution, advertising, and selling scribd.com+1en.wikipedia.org+1. • Explore marketing channels and agents Identify the agents involved in agricultural marketing (producers, middlemen, cooperatives, wholesalers, retailers) and outline different distribution channels

9. Teaching and Learning Strategies

Strategy	**. Define Target Markets & Positioning**

- Use **market segmentation** to identify consumer groups (e.g., organic buyers, local restaurants, institutions) .
- Formulate a **positioning statement** that highlights unique selling points—like sustainability, freshness, or organic certification

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2. Set SMART Objectives

- Establish clear, measurable goals (e.g., "Increase online sales by 25% in 12 months".
- Align these with broader business aims—such as expanding market reach, launching value-added products, or sustaining seasonal operations

10. Course Structure

Week	Hours	Unit or subject name	Required Learning Outcomes	Learning method	Evaluation method
1	2 Theory	• Concept of Market and Agricultural Marketing	Understanding the definition of market and agricultural marketing, and distinguishing between them.	Theoretical lectures, class discussions, practical examples.	Quizzes, essay questions
2	2 Theory	• Importance of Agricultural Marketing Processes	Analyzing the role of marketing processes in improving the distribution of agricultural products.	• Case studies, presentations, group discussions.	Analytical reports, presentation evaluations
3	2 Theory	• Objectives of Agricultural Marketing	Identifying the main objectives of agricultural marketing, such as increasing efficiency and achieving consumer satisfaction.	Interactive lectures, workshops.	• Written exams, research projects
4	2 Theory	Research Methodologies in Marketing Studies	Familiarizing with quantitative and qualitative methodologies in agricultural marketing research.	Practical lessons, analysis of previous studies.	• Research paper submission, critical evaluation of studies
5	2 Theory	Transportation Means and Selection Criteria	Understanding the types of transportation means and criteria for selecting the most appropriate for agricultural products.	Field visits, lectures, case studies.	Field reports, practical tests
6	2 Theory	• Functions and Facilitative Services	Analyzing the role of facilitative services like storage and packaging in the marketing chain.	Lectures, discussions, practical examples.	Short quizzes, class participation assessments
7	2 Theory	Organizational Structure	Understanding the organizational structure of agricultural marketing and the role of various institutions.	• Lectures, case studies, discussions.	• Written exams, analytical reports
8	2 Theory	Midterm Exam 1	Conducting a	• Comprehensive	• Comprehensive

			comprehensive evaluation of the knowledge and skills acquired in the first half of the semester.	review, mock tests.	written exam covering previous topics
9	2 Theory	Types of Markets	Distinguishing between types of markets, such as local, regional, and national.	• Lectures, case studies, discussions.	• Short quizzes, analytical reports
10	2 Theory	Origin of Food Industries	Understanding the development of food industries and their role in the agricultural economy.	• Lectures, field visits, case studies.	• Field reports, written exams
11	2 Theory	• Demand for Agricultural Commodities	Analyzing factors affecting the demand for agricultural products.	Lectures, analytical exercises, discussions.	• Practical tests, analytical reports
12	2 Theory	Price Elasticity of Demand	Understanding the concept of price elasticity of demand and its applications in agricultural marketing.	Practical lessons, computational exercises.	• Short quizzes, applied problems
13	2 Theory	• Agricultural Supply	Analyzing factors affecting agricultural supply and its interaction with demand.	• Lectures, case studies, discussions.	• Written exams, analytical reports
14	2 Theory	• Agricultural Prices	Understanding how agricultural prices are determined and the factors influencing them.	Lectures, applied exercises, discussions.	• Practical tests, analytical reports
15	2 Theory	• E-Marketing Electronic Marketing	Understanding the definition of market and agricultural marketing, and distinguishing between them.	Workshops, practical lessons, case studies.	• Applied projects, presentation evaluations

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Available
Main references (sources)	**Agricultural Marketing** Author: Dr. Talal Hussein Al-Shammari Publisher: Dar Al-Thaqafa for Publishing and Distribution – Amman Edition: Multiple editions available (between 2005–2015)
Recommended books and references (scientific journals, reports…)	**1. Agricultural Marketing – Concepts and Applications** **2. Dr. Adnan Jawad Al-Tama** **3.** **4. Principles of Agricultural Marketing** 5. **Dr. Khalil Ibrahim Al-Daw**
Electronic References, Websites	https://www.youtube.com/watch?v=1l8EWaSfzmc

Course Description Form

1..Course Title:
poultry Breeding and Improvement
2.Course Code:
ANP356
3.Level / Academic Year:
Third Year / 2024−2025
4.Date of Description Preparation:
17/07/2025
5.Available Attendance Modes:
In-person
6.Total Credit Hours / Units:
60 hours (1 theoretical + 3 practical) × 15 weeks/3
7.Course Coordinator (All names if multiple):
Name: Haneen Mowfak Ahmed Email: Haneen.mowfak@ntu.edu.iq
8. Course Objectives:
• Understand the methods of breeding and improvement of farm animals. • Gain knowledge about ways to enhance animal productivity in terms of meat and milk. • Learn about the history and development of animal breeding and improvement sciences, including theories of evolution. • Understand selection methods and tools. • Enhance student skills regarding methods of increasing agricultural animal productivity.
9. Teaching and Learning Strategies:
• Discussion and dialogue strategy • Brainstorming • Self-learning • Group collaborative assignments • Report writing task
10.Course Structure:

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4 Hours (1Theory+3 3 Practical)	Theory: A1. Understand statistical principles related to animal	Theory: Principles of statistical operations in	Presentation, explanation, Q&A, interactive	Oral, written and practical daily assessments and

		breeding including significance tests and analysis of variance. Practical: A1. Recall and understand statistical calculations related to animal breeding and improvement.	animal breeding. Practical: Measures of dispersion and central tendency	discussion, self-learning.	scientific reports.
2	4 Hours (1Theory+3 3 Practical	Theory: B1. Explain major gene expression patterns and gene types. Practical: A2. Understand regression and correlation coefficients	Theory: Gene expression patterns and genetic principles in breeding. Practical: Measures of correlation and regression	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports.
3	4 Hours (1Theory+3 3 Practical	Theory: A3. Explain gene frequency in the case of single or multiple gene pairs. Practical: C3. Apply calculations of gene and allele frequencies.	Theory: Gene frequency and mating types. Practical: Understanding gene frequency and calculation of genetic compositions	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
4	4 Hours (1Theory+3 3 Practical	Theory: A4. Identify factors affecting gene frequency such as drift, migration, mutation, andselection. Practical: C3. Apply calculations for gene frequency and analyze influencing factors.	Theory: Factors affecting gene frequency. Practical: Application of gene frequency and its influencing factors.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
5	4 Hours (1Theory+3 3 Practical	Theory: A4. Explain the relationship between reproduction and breeding. Practical: C4. Measure reproductive traits.	Theory: Reproduction and its rates in animals. Practical: Reproduction and its rates in animals.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
6	4 Hours (1Theory+3 3 Practical	Theory: A5. Differentiate between types of	Theory: Types of selection - natural and	Presentation, explanation, Q&A,	Oral, written and practical

		selection. Practical: C5. Analyze selectiondata. B2. Collaborate in group work.	artificial. Practical: Types of selection	interactive discussion, self-learning.	daily assessments and scientific reports
7	4 Hours (1Theory+3 3 Practical	Theory: A6. Explain the concept of heritability and relationship among relatives. Practical: C4. Use and apply heritability rates and kinship formulas	Theory: Heritability, variance analysis, and relationships among relatives. Practical: Variance analysis and kinship.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
8	4 Hours (1Theory+3 3 Practical	Evaluate.student comprehension	First Midterm Exam (Theory).	Presentation, explanation, Q&A, interactive discussion, self-learning.	Written examination
9	4 Hours (1Theory+3 3 Practical	Theory: B3. Explain breeding based on genetic and phenotypic similarity. Practical: C4. Calculate inbreeding and outbreeding coefficients.	Theory: Types of breeding (inbreeding, outbreeding, line breeding). Practical: Types of breeding.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
10	4 Hours (1Theory+3 3 Practical	Theory: A3. Understand main types of crossbreeding. Practical: C2. Evaluate improvement rates.	Theory: Types of crossbreeding. Practical: Hardy-Weinberg Law.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
11	4 Hours (1Theory+3 3 Practical	Theory: C6. Define genetic equivalence and genetic parameters. Practical: C5. Write and interpret a report on genetic equivalence and parameters.	Theory:Genetic parameters in animal herds. Practical:Genetic equivalence	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
12	4 Hours (1Theory+3 3 Practical	Theory: C7. Explain calculation of repeatability.	Theory: Repeatability and its purpose.	Presentation, explanation, Q&A,	Oral, written and practical

		Practical: C6. Calculate repeatability coefficient.	Practical: Method of calculating repeatability	interactive discussion, self-learning.	daily assessments and scientific reports
13	4 Hours (1Theory+3 3 Practical	Evaluate.student comprehension	Second Midterm Exam (Practical).	Presentation, explanation, Q&A, interactive discussion, self-learning.	Written examination
14	4 Hours (1Theory+3 3 Practical	Theory: B2. Explain the concept of selection intensity and genetic correlation. Practical: C7. Calculate genetic correlation and selection intensity.	Theory: Genetic correlation, selection intensity, and genetic selection. Practical: Genetic correlation and its calculation	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
15	4 Hours (1Theory+3 3 Practical	Theory: B6. Explain animal records and modern approaches in animal breeding and improvement. Practical: C8. Present a proposed project	Theory:Animal records and improvement projects in.Iraq. Practical: Animal records	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports

11.Course Evaluation

Grade distribution out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral tests, monthly or written exams, reports, etc

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Animal Breeding by Salah Jalal and Hassan Karam Principles of Animal Genetics and Breedin by Maher Hasab Al-Nabi Khalil
Electronic References, Websites	Animal Breeding and Genetics for BSc Students

Course Description Form

1. Course Name:
Embryo Transfer and artificial insemination
2. Course Code:
ANP 402
3. Semester / Year:
Semester
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
78 / 8
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed Azeez Mohammed Email: mddazz84@ntu.edu.iq
8. Course Objectives

Course Objectives	**1.Understand reproductiveanatomy/physiology (estrous cycles, ovulation, gamete biology).** **2. Learn hormonal control for estrus synchronization.** **2. Develop Technical AI/ET Skills: Perform semen collection/evaluation (CASA, microscopy). Practice AI techniques (vaginal, cervical, surgical) in key species (cattle, sheep, horses).** **3. Implement Reproductive Technologies: Apply cryopreservation (semen/embryo freezing).** **4. Ensure Ethical & Efficient Management Follow biosecurity/welfare protocols. And Optimize breeding programs for genetic improvement.**

9. Teaching and Learning Strategies

Strategy	Course Outcomes Definition **Veterinary Embryo Transfer (ET) and Artificial Insemination (AI)** is designed to equip students with comprehensive knowledge, practical skills, and professional values in assisted reproductive technologies. By the end of the course, students will be able to **explain key concepts of reproductive physiology**, including estrous cycles, hormonal regulation (such as PGF2α, eCG, and GnRH protocols), and factors affecting fertility in domestic animals. They will gain **hands-on proficiency in AI techniques**, covering semen collection,

	evaluation (using CASA and microscopic analysis), and proper insemination methods (vaginal, cervical, or laparoscopic) across species like cattle, sheep, and horses. Additionally, students will master **embryo transfer procedures**, from donor superovulation and non-surgical embryo recovery to embryo grading, cryopreservation, and transfer into synchronized recipients.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student will understand the concept of ET.	Introduction to Assisted Reproductive Technologies	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student will understand the steps for ET.	Anatomy and Physiology of Farm Animals	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will distinguish between types of ET in different animals.	Artificial Insemination	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will understand the Semen Evaluation.	Semen Evaluation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student will understand methods of semen collection.	Semen Collection Techniques in Animals	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	The student will understand the environmental factors affecting semen	Semen Preservation and Transport	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	The student will understand the. Artificial Insemination	Artificial Insemination	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	The student will understand the advantage of ET.	Embryo Transfer	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	The student will understand routs of collection	Embryo Collection and Selection	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	The student will learn the calculation of suitable transfer time.	Recipient Preparation and Timing of Transfer	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	The student will understand the how to preservation.	Embryo Cryopreservation	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student will understand each hormone action.	Environmental and Hormonal Factors for Successful Transfer	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

13	5	The student will understand the trebles overcome.	Common Issues and Solutions in AI and ET	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student will understand Recen Technological Advances in Reproduction.	Recent Technological Advances in Reproduction	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student will understand practical application	Field Applications and Practical Insights	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular boc if any)	**"Manual of the International Embr Transfer Society (IETS)**
Main references (sources)	• Schoolcraft, W. B., et al. (2001). *"Embryo transfer: techniques and variables affecting success."* **Fertility and Sterility**, 76(5), 863-870. Brown, J. A., et al. (2016). "*Ultrasound-guided embryo transfer improves pregnancy rates.*" Human Reproduction, 31(5), 1011-1018.
Recommended books and references (scientific journals, reports…)	Textbook of Poultry Production and Management, Dr. Girrag Goyal
Electronic References, Websites	https://www.eshre.eu/Guidelines-and-Legal/Guidelines/IVF-in-routine-care https://www.fertstert.org/article/S0015-0282(16)61299-8/fulltext https://www.rbmojournal.com/article/S1472-6483(20)30007-5/fulltext

Course Description Form

1. Course Name:
beef cattle production
2. Course Code:
ANP 403
3. Semester / Year:
Semester 1 / Year 4
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
200 hr. / 8 Units
7. Course administrator's name (mention all, if more than one name)
Name: Waseem Amer Hashem Email: wasseem_amer@ntu.edu.iq
8. Course Objectives
Course Objectives • **1. Students will be able to apply the concepts and theories acquired in practical situations related to beef cattle production.** • **2. Students will analyze and evaluate various aspects of beef cattle production to improve production efficiency and quality.** • **3. Students will be able to identify and diagnose diseases and health problems that may face beef cattle.** • **4. Students will apply modern tools and technologies to improve production processes and increase productivity.** • **5. Students will be able to develop effective strategies for successfully marketing meat products.**
9. Teaching and Learning Strategies
Strategies **1. Project-Based Learning: Students are assigned to design a project to manage a beef production unit or develop a feeding plan to improve carcass quality.** **2. Field Studies and Practical Visits: Organizing trips to beef cattle farms or slaughter and food**

processing units.

3. Real-Life Case Analysis: Discussing a real-life problem such as "low conversion efficiency in a particular breed" or "the impact of environmental conditions on growth."

4. Active Learning: Includes classroom activities such as brainstorming, forming groups to compare breeds, or analyzing production schedules.

5. Blended Learning: Integrating traditional lectures with online materials such as videos on herd management or tools for designing digital feeding plans.

6. Practical Simulation: Using digital or paper models to calculate production performance indicators such as feed conversion ratio or average weight gain.

7. Discussion on Values and Ethics: Raising issues related to animal welfare, slaughtering practices, and halal meat production.

8. Student Presentations: Students present summaries on global beef cattle breeds or modern production technologies.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	To familiarize the student with livestock in agriculture and the economic importance of raising them..	The importance of cows in meat production.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student will learn about the origin of livestock, the location of the animal kingdom.	local and global cattle breeds.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	To enable the student to understand the factors and constraints affecting animal production.	Methods for developing meat production.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student should know reproductive efficiency.	methods of measuring it.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
5	5	The student will learn about the factors affecting the health of	the health of newborn calves.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

		pregnant cows.			
6	5	The student should know how to produce healthy.	fattening methods.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	To enable the student to understand the genetic basis of improvement.	To appreciate the value of genetic improvement.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	The student should know the methods of genetic improvement in livestock .	mating systems.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	The student should know the anatomy and physiology of the digestive process.	the needs of animals for nutrients and compounds.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	The student should know livestock nutrition, the most important livestock feeds.	the composition and calculation of balanced rations.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	The student should be able to distinguish between fattening methods.	fattening requirements.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student will learn about producing healthy meat free from pathogens.	factors that cause meat spoilage and corruption.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student should learn about livestock health.	the preventive program for herd health.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student will learn about establishing livestock farms, raising calves and cows.	managing herds of different ages.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student will be able to distinguish between the storage and marketing of animal products, compared to	processed meat.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

		meat.			

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Meat Animal Production Meat Cattle Production
Main references (sources)	By Mohammad Reza Anawi, Dr. Fouad Abdul Latif Abdul Karim
Recommended books and references (scientific journals, reports…)	Beef Cattle Raising for Dummies Paperback – Illustrated, July 3, 2012 By Scott Royer (Author) Nicky Royer (Author)
Electronic References, Websites	https://almerja.net/reading.php?idm=48213

Course Description Form

1. Course Name:
"Techniques for Farm Establishment and Management"
2. Course Code:
ANP 405
3. Semester / Year:
Spring
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
In-person attendance in the classroom
6. Number of Credit Hours (Total) / Number of Units (Total)
60/3
7. Course administrator's name (mention all, if more than one name)
Name: Doaa Qasim Sabri Email: dqasm0478@ntu.edu.iq
8. Course Objectives

Course Objectives	**1. Technical and Practical Knowledge:** Empower students to understand the fundamental principles of farm (field) design and establishment, including land planning, equipment selection, and the application of modern technologies in crop and livestock production. **2. Development of Applied Skills:** Equip students with the practical skills necessary to manage fields effectively, such as organizing planting and harvest operations, managing water resources, and maintaining agricultural machinery. **3. Enhancement of Production Efficiency:** Teach students how to improve productivity by applying best practices in field management, including the use of modern technologies and agricultural data analysis.

9. Teaching and Learning Strategies	
Strategy	

Principles of Animal Husbandry and Production

- Understanding the objectives and methods of raising and handling animals, balancing between productivity and animal welfare, and including different growth stages.

2. Analysis of Nutrition and Health Requirements

- Understanding animals nutritional needs based on species, analyzing the nutritional value of feeds, and recognizing signs of nutrient deficiencies.
- Identifying common diseases in poultry and livestock, and understanding prevention methods, nutritional supplementation, or necessary treatments.

3. Understanding the Structure of Facilities and Their Equipment

- Defining types of housing facilities, production tools, ventilation systems, waste management, and veterinary hygiene guidelines.

10. Course Structure

Week	Hours	Unit or subject name	Required Learning Outcomes	Learning method	Evaluation method
1	1 Theory + 3 Practical	Concept of Farm M es and Duties	Understand the fundamentals of farm management and identify associated goals and duties.	Lecture, group discussions	Short quiz, participation in discussions
2	1 Theory + 3 Practical	Science of Farm Management and Economic Foundations	Apply economic concepts to farm management.	Lecture, case study	Case study analysis
3	1 Theory + 3 Practical	farm Revenues	Calculate and analyze the various revenue sources of the farm.	Practical workshops, exercises	Practical exercise report
4	1 Theory + 3 Practical	Farm Decision-Making	Make effective decisions based on analysis of available data and information.	Decision-making simulation, case studies	Performance in simulation, case analysi
5	1 Theory + 3 Practical	Principle of Determining the Optimal Level of Production	Identify the optimal production level to achieve maximum profit.	Lecture, analytical exercises	Short quiz, data analysis exercise
6	1 Theory + 3 Practical	Principle of Substitution and Resource Allocation	Understand and apply the substitution principle in resource allocation for efficiency.	Workshops, practical exercises	Applied exercise report
7	1 Theory + 3 Practical	Principle of Opportunity Cost	Analyze opportunity costs and make informed decisions.	Lecture, group discussions	Short quiz, participation in discussion
8	1 Theory + 3 Practical	Mid-Term Exam	Conduct a comprehensive assessment of what has been learned so far.	–	Mid-term written exa
9	1 Theory +	Principle of	Apply economic	Lecture, practical	Short quiz, applied

	3 Practical	Comparative Advantage and Equal Marginal Returns	concepts to optimize resource usage efficiently.	exercises	exercis
10	1 Theory + 3 Practical	Farm Planning	Develop a comprehensive farm management plan.	Workshops, planning exercises	Plan report, practical evaluatio
11	1 Theory + 3 Practical	Farm Management Methods	Explore and apply different methods and techniques of farm management.	Lecture, case studies, practical exercises	Practical assessment, case analysi
12	1 Theory + 3 Practical	economic Feasibility of Projects	Evaluate the economic feasibility of various agricultural projects.	Lecture, analysis exercises	Feasibility report
13	1 Theory + 3 Practical	measures of Economic Efficiency	Use different metrics to measure economic performance efficiency.	Workshops, practical exercises	Practical metrics analysis
14	1 Theory + 3 Practical	Risk and Uncertainty	Identify and analyze risks and uncertainties in farm management.	Lecture, group discussions	Short quiz, participation in
15	1 Theory + 3 Practical	Final Exam	Conduct a comprehensive assessment covering the entire course.	–	Final written exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	Available
Main references (sources)	Concept of Farm Management: Objectives and Duties Dr. Hashim Al-Alwan Al-Samara'i Science of Farm Management and Economic Foundations Dr. Hashim Al-Alwan Al-Samara'i Farm Revenues Dr. Hashim Al-Alwan Al-Samara'i
Recommended books and references (scientific journals, reports…)	**1. Agricultural Marketing – Concepts and Farm Management and Agricultural Extension – Part One College of Agriculture Library, University of Al-Qadisiyah (agr.qu.edu.iq)** **2. Natural Pasture Management Dr. Ramadan Ahmed Al-Tikriti et al.; College of Agriculture, University of Al-Qadisiyah (agr.qu.edu.iq)** 3. **Farm Management George Frederick Waugh; Noor Electronic Library (noor-book.com)**
Electronic References, Websites	https://www.youtube.com/channel/UCwC-E-UQXZpk2HaLzC2e1Eg https://www.youtube.com/watch?v=1nb6H3nW1fM

Course Description Form

1. Course Name:
Genital diseases and obstetrics
2. Course Code:
ANP 406
3. Semester / Year:
Semester 8 \ year 4
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 / 3
7. Course administrator's name (mention all, if more than one name)
Name: Yahya Natiq Mohammed Email: yahyanatiq2003@ntu.edu.iq
8. Course Objectives

Course Objectives	1. **Understand Reproductive Anatomy and Physiology: Learn the normal structure and function of the male and female reproductive systems in domestic animals.** 2. **Diagnose Genital Diseases: Identify common infectious, inflammatory, neoplastic, and congenital diseases affecting the reproductive tract.** 3. **Manage Obstetric Conditions: Understand the stages of normal parturition (eutocia) and recognize dystocia (difficult birth) in various species.** 4. **Prevent and Control Reproductive Disorders:Study breeding management, biosecurity.**

9. Teaching and Learning Strategies

Strategy	Course Outcomes Definition: The Veterinary Genital Diseases and Obstetrics course uses a blended learning approach combining lectures, case discussions, and hands-on labs (dissection, semen analysis, ultrasound training) with clinical rotations for real-world

	experience in dystocia management and reproductive surgeries. Simulation models and virtual tools enhance practical skills, while problem-based learning and workshops develop critical thinking and technical abilities. E-learning resources supplement instruction, and regular assessments ensure competency. This balanced theory-practice approach prepares students to effectively diagnose and manage reproductive conditions in clinical practice.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student will understand the concept of Reproductive Anatomy.	Reproductive Anatomy	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student will understand the Physiology of Reproduction .	Physiology of Reproduction	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will distinguish between types of. Genital Infections	Genital Infections	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student will understand the Infertility in Animals	Infertility in Animals	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student will understand (AI) .	Artificial Insemination (AI)	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	The student will capable Pregnancy Diagnosis .	Pregnancy Diagnosis	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	The student will understand the Dystocia causes.	Dystocia (Difficult Birth)	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	The student will understand the Obstetric	Obstetric Surgery	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

		Surgery			
9	5	The student will understand Uterine Prolapse causes .	Uterine Prolapse	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	The student will learn the requirements for Semen Analysis .	Semen Analysis	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	The student will understand the types of Hormonal Disorders .	Hormonal Disorders	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student will understand the Embryo Transfer techniques .	Embryo Transfer	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student will understand the Venereal Diseases	Venereal Diseases	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student will understand the Neonatal Care .	Neonatal Care	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student will understand Reproductive Biotechnology .	Reproductive Biotechnology	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	**Bovine Reproduction**
Main references (sources)	
Recommended books and references (scientific journals, reports…)	**Merck Veterinary Manual – Reproductive Disorders**

Electronic References, Websites	https://www.wiley.com/en-us/Bovine+Reproduction-p-9781119602794 https://www.elsevier.com/books/canine-and-feline-theriogenology/root/978-0-323-53239-3 https://www.merckvetmanual.com/reproductive-system https://www.wiley.com/en-us/Equine+Reproduction%252C+2nd+Edition-p-9780813814189

Course Description Form

1.Course Title:
Feed Manufacturing
2.Course Code:
ANP407
3.Level / Academic Year:
Fourth Year / 2024–2025
4. Date of Description Preparation:
17/07/2025
5.Available Attendance Modes:
In-person
6.Total Credit Hours / Units:
60 hours (1 theoretical + 3 practical) × 15 weeks
7.Course Coordinator (All names if multiple):
Name: Haneen Mowfak Ahmed Email: Haneen.mowfak@ntu.edu.iq
8. Course Objectives:
1. Understand the processes and principles of feed manufacturing, including the selection of suitable raw materials and the procedures of mixing and processing. 2. Acquire knowledge about nutritional value and balanced feeding for animals, and how to achieve it through feed formulation. 3. Apply safety and quality principles in feed manufacturing processes, including proper storage and safe, efficient transportation. 4. Understand the types of dietary supplements and various additives that can be included in feed and their impact on animal health and productivity. 5. Evaluate the quality and nutritional value of feed.
9. Teaching and Learning Strategies:
• Discussion and dialogue strategy • Brainstorming • Self-learning • Group collaborative assignments • Report writing task
10.Course Structure:

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4 Hours (1Theory+3	**D.H1:** The student should be able to	Management and	Presentation, explanation,	Oral, written and

	3 Practical)	analyze the stages of feed manufacturing o rganization and evaluatetheir efficiency	Organization of Feed Manufacturing Operations	Q&A, interactive discussion, self-learning.	practical daily assessments and scientific reports.
2	4 Hours (1Theory+3 3 Practical	**B.D1:** The student should understand the role of feed additives and classify their types	Non-nutritional Feed Additives in Poultry Rations	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports.
3	4 Hours (1Theory+3 3 Practical	**C3:** The student should apply the steps of ration formulation in a practical manner	Scientific Steps in Formulating Poultry Rations	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
4	4 Hours (1Theory+3 3 Practical	**C.W4:** The student should be able to reconstruct the ration based on specific conditions	Scientific Steps in Formulating Poultry Rations	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
5	4 Hours (1Theory+3 3 Practical	**.H4:** The student should evaluate the advantages and disadvantages and analyze the influencing factors	Feeding Poultry with Pellets: Advantages, Disadvantages, and Influencing Factors	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
6	4 Hours (1Theory+3 3 Practical	**B.H6:** The student should discuss the effect of added fats and compare the outcomes	Pros and Cons of Adding Fats to Poultry Rations	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
7	4 Hours (1Theory+3 3 Practical	**C7:** The student should carry out practical calculations of feed costs	Cost Calculations of Feed Ingredients and Feed Manufacturing	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
8	4 Hours (1Theory+3 3 Practical	Evaluate.student comprehension	Basic Steps in Calculating Metabolizable Energy in Classified Poultry Rations	Presentation, explanation, Q&A, interactive discussion, self-learning.	Written examination
9	4 Hours (1Theory+3 3 Practical	**C3:** The student should explain energy concepts and calculate them practically.	Feed Formulation and Manufacturing: Straw Treatment and Bulky Feed Processing	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
10	4 Hours (1Theory+3 3 Practical	**C.D3:** The student should analyze the treatment methods and apply them.	Concentrated Feeds: Processing and Nutritional Additive	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
11	4 Hours (1Theory+3	**A.H6:** The student should define	Factors Affecting the	Presentation, explanation,	Oral, written and

	3 Practical	concentrated feeds and evaluate the effect of additives	Nutritional Value of Feed	Q&A, interactive discussion, self-learning.	practical daily assessments and scientific reports
12	4 Hours (1Theory+3 3 Practical	**A.H7:** The student should identify the influencing factors and analyze their effect	Management and Organization of Feed Manufacturing Operations	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
13	4 Hours (1Theory+3 3 Practical	Evaluate.student comprehension	on-nutritional Feed Additives in Poultry Rations	Presentation, explanation, Q&A, interactive discussion, self-learning.	Written examination
14	4 Hours (1Theory+3 3 Practical	**B2:** The student should distinguish between types and evaluate their usefulness.	Scientific Steps in Formulating Poultry Rations	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
15	4 Hours (1Theory+3 3 Practical	**B.D6:** The student should formulate a complete ration based on production needs and produce specific	cientific Steps in Formulating Poultry Rations	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports

11.Course Evaluation

Grade distribution out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral tests, monthly or written exams, reports, etc

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	كتاب تصنيع الاعلاف / د.خليل إبراهيم علي
Electronic References, Websites	علم تغذية الحيوان وتكوين الاعلاف/ د.أحمد الجندي

Course Description Form

1.Course Title:

Ruminant Digestive Physiology

2. Course Code:

ANP 408

3. Level / Academic Year:

second Year / 2024-2025

4. Date of Description Preparation:

17/07/2025

5.Available Attendance Modes:

In-person

6. Total Credit Hours / Units:

٧٥ hours /3

7. Course Coordinator (All names if multiple):

Name:

Email:

8.Course Objectives:

Introducing the student to the organs of the ruminant digestive system and the function of each organ, to facilitate a better understanding of feed materials and how to achieve optimal animal productivity through proper and coordinated performance between all digestive organs and the consumed nutrient

9. Teaching and Learning Strategies:

- Discussion and dialogue strategy
- Brainstorming
- Self-learning
- Group collaborative assignments
- Report writing task

10.Course Structure:

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5 Hours	B.The student should **explain** the anatomical and functionaldifferences between species	Development of the stomach and intestines during the animal's life stages; comparison betweenruminants,	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports.

			non-ruminants, and pseudo-ruminants		
2	5 Hours	D.The student should **analyze** feeding behavior and the role of saliva in digestio	Feed intake, chewing, animal behavior during feeding and suckling Saliva: quantities, composition, and function	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports.
3	5 Hours	B.The student should **describe** thfeed movement sequence and explain rumen functions	Movement of consumed feed through the digestive tract; rumination, eructation, rumen pressure, and coordination of swallowing and defecatio	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
4	5 Hours	B.D.The student should distinguish types of microorganisms and analyze their roles in digestion	Rumen bacteria and protozoa, and the enzymes secreted by them and the digestive tract	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
5	5 Hours	D.The student should analyze the fermentation mechanisms of carbohydrates and fats in the rumen	Rumen fermentations: carbohydrates and lipids	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
6	5 Hours	E.The student should **evaluate** the effects of different compounds on fermentation efficiency	Rumen fermentations: nitrogenous compounds, and the role of vitamins and minerals in rumen fermentatin	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
7	5 Hours	D.E.T he student should **compare** the digestive system of ruminants and poultry	Overview of digestive system anatomy and physiology in poultry	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
8	5 Hours	Exam		Presentation, explanation, Q&A, interactive discussion, self-learning.	Written examination
9	5 Hours	B.The student should **explain** the mechanism of nutrient transport in poultr	Movement of nutrients within the digestive system of poultryFactors affecting feed intake in poultry (feeding behavior, energy requirements, other nutrients, specific appetites, water, egg laying, and secondary factors such as medications, stress, stimulation, and forcing)	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports

10	5 Hours	B.D. The student should **explain** neural and metabolic regulation of appetit	physiological control of feed intake (central nervous system, metabolic control, gastric and intestinal regulation.	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
11	5 Hours	C.D. The student should **apply** absorption concepts and **analyze** influencing factors	Absorption in the digestive tract (absorption processes, mechanisms, amino acid transport, amino acid competition, absorption of fatty acids, sugars, vitamins, glycosides, and factors that reduce absorption)	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
12	5 Hours	Exam		Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
13	5 Hours	B.The student should **understand** how food is converted and stored as energy	Energy production and storage in poultry	Presentation, explanation, Q&A, interactive discussion, self-learning.	Written examination
14	5 Hours	B.The student should **distinguish** the functions of pancreatic enzymes and bile	Role of the pancreas in digestion in poultry (pancreatic enzymes and bile)	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports
15	5 Hours	f.the student should **design** a feeding plan based on poultry nutritional need	Regulation of feed intake in poultry	Presentation, explanation, Q&A, interactive discussion, self-learning.	Oral, written and practical daily assessments and scientific reports

11.Course Evaluation

Grade distribution out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral tests, monthly or written exams, reports, etc

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	فسيولوجيا الهضم والتغذية في المجترات/د. عبد الرضا جليل الحسني
Electronic References, Websites	The Ruminant Animal: Digestive Physiology and Nutrit by D. C. Church

Course Description Form

1. Course Name:
Poultry Diseases
2. Course Code:
ANP 409
3. Semester / Year:
Semester ٧ / Year ٤
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hr. \ 3 Units
7. Course administrator's name (mention all, if more than one name)
Name: Yahya Natiq Mohammed Email: yahyanatiq2003@ntu.edu.iq
8. Course Objectives
1. Understanding Poultry diseases: The study of diseases that can be transmitted between the birds . **2. Identifying diseases: Identifying types of Poultry diseases, such as bacterial, viral, and parasitic diseases.** **3. Studying biological pathogens: Understanding the biological basis of these diseases.** **4. Transmission Methods: Study the ways diseases are transmitted between birds, and between susceptible one.** **5. Understanding the Health Impact: Understand the health impact of these diseases on birds.** **6. Diagnosis and Treatment: Study the methods of diagnosing and treating these diseases.** **7. Prevention and Control: Learn strategies for preventing and controlling these diseases.**
9. Teaching and Learning Strategies
1. Problem-based learning: Using real-life problems to promote critical thinking and learning. 2. Cooperative learning: Encouraging teamwork and collaboration among students. 3. Field visits: Organizing field visits to health or veterinary centers. 4. Self-directed learning: Encouraging students to engage in independent

learning and research.
5. Project-based learning: Encouraging students to work on research projects.
6. Learning through Discussion: Encourage students to participate in discussions and debates.
7. Continuous Assessment: Conduct ongoing assessments throughout the semester.
8. Self-Assessment: Encourage students to evaluate their performance and identify areas for improvement.
9. Additional Resources: Provide additional resources such as books and electronic references.
10. Summative Assessment: Conduct a final assessment at the end of the semester.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Students learn about the types of poultry diseases.	**Poultary disease classification**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	Students learn about the importance of nutrition and diseases caused by malnutrition.	**Mal nutrition diseases**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	Students learn about the signs of salmonella.	**Diagnosis of salmonellosis**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	Students learn about the types of diseases caused by Escherichia coli.	**Diagnosis of E.coli**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
5	5	Students learn about the signs of coryza.	**Diagnosis of coryza**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	The student learns the signs of CRD.	**Diagnosis of CRD**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	The student learns the signs of Newcastle disease.	**Diagnosis of ND**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	The student learns about Camporo disease.	**Diagnosis gumboro**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	The student learns about bronchitis.	**Diagnosis of IB,ILT**	Presentation, explanation,	Oral, written and daily practical tests

				questions and answers, discussion	and scientific reports
10	5		**Diagnosis Neoplasma**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	The student learns about the classification of parasitic diseases.	**Diagnosis of parasitic diseases**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	The student learns about the methods of administering medications to poultry.	**Traning for pharmacolgicl preperation**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student learns about the programs specific to each breeding method.	**Types of vaccine and vaccination methodes**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student learns about the classification of fungal diseases.	**Diagnosis of fungal diseaes**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student learns about the symptoms of Marek's disease.	**Diagnosis of mark disease**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	No curricular books
Main references (sources)	**Poultry Diseases" by Pattison, which is currently in its sixth edition**
Recommended books and references (scientific journals, reports…)	'mportant Poultry Diseases" booklet is also a valuable resource for basic understanding of the most important poultry diseases
Electronic References, Websites	https://www.poultryworld.net/health-tool/

Course Description Form

1. Course Name:
Wild and ornamental animals
2. Course Code:
ANP 451
3. Semester / Year:
Semester
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 / 3
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed Waad Mohammed Email: mohammed.waad88@ntu.edu.iq
8. Course Objectives

Course Objectives	**• Awareness of the importance of biodiversity: Understanding the vital role wild and domestic animals play in ecosystems and how they impact ecological balance. 1.** **• Conservation of endangered species: Identifying threatened species and the causes of their threat, and working to protect them from extinction through conservation and awareness programs. 2.** **• Environmental education: Promoting environmental awareness among students and the community about the importance of preserving the environment and wildlife, and encouraging sustainable behaviors. 2.** **• Scientific research and discovery: Encouraging scientific research to understand the behaviors and needs of wild and domestic animals, which helps develop effective strategies for their conservation. 2.** **• Ecological balance: Understanding how human activities impact wildlife and domestic animals, and working to reduce these negative impacts through sustainable policies and procedures.**

9. Teaching and Learning Strategies	
Strategy	Course Outcomes

	Definition: A set of knowledge, skills, and values that a course seeks to achieve in students. Importance: It provides the learner with a clear idea of what they will be able to do after completing the course, and it helps in designing and evaluating courses. How They Are Determined: Course outcomes are determined based on the objectives of the academic program to which the course belongs.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Definition of wild animals	Interactive lecture	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The origin of wild animals and the definition of their types	Subheadings Defining the Problem Formulating Questions	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The material, moral, touristic and vital benefits of wild animals	Importance How Types and Evaluation of These Types	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	Classification of wild animals	The student will be able to classify wild animals based on different species and breeds.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
5	5	Detailed explanation of the types of wild animals	The student will be able to identify the types of wild animals based on different species and breeds.	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	Types of wild animals in Iraq	Iraqi Wildlife Distribution Importance	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	Horses and camels	Types and Care Methods Training Education	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	Birds of prey	Types and Care Methods Training Education	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	hounds	Types and Care Methods Training Education	Presentation, explanation, questions and answers,	Oral, written and daily practical tests and scientific reports

				discussion	
10	5	Animal behavior problems	Why study?	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	Animal rights in Islam	Lecture, workshop	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
12	5	Nutritional care for wild animals	Lectures, practical software training, workshops	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	Reproductive care of wild animals	Lectures, practical software training, workshops	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	Ducks, geese and guinea fowl all have a final assessment test.	Lectures, practical software training, workshops	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	Field visit to zoos and nature reserves	Conducting scientific trips	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	A Book of the Wonders of Wild Animal Creation by Muhammad Ismail al-Jawish A Book of Wild Animal Management by Prof. Hamid Majeed al-Bayati A Book of Wild and Zoo Animals by Jacob V. Cheeran
Recommended books and references (scientific journals, reports…)	Text book of wild and zoo animals/jacob v.cheeran
Electronic References, Websites	Wekipedia.org wild animals

Course Description Form

1. Course Name:
Animal production techniques
2. Course Code:
Egg and Sperm Technology / ANP452
3. Semester / Year:
Second / 2024-2025
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
My presence
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hours/ Number of Units (2)
7. Course administrator's name (mention all, if more than one name)
Name: AbdulRhman B. Al-Hamdani Email: abdalrahman.ba.aw@ntu.edu.iq
8. Course Objectives
Course Objectives - The student will understand the scientific basis of the anatomical and functional structure of the reproductive system (male and female). - Learn the physiological processes of spermatogenesis and oogenesis. - Understand the mechanisms of oocyte and sperm maturation and their interaction in the natural fertilization process. - Learn methods for collecting semen from different male animals (massage, artificial vagina, electroporation, surgery). - Master semen quality assessment (volume, color, concentration, motility, vitality, and abnormalities) using a microscope and laboratory instruments. - Understand the principles of semen dilution (semen extenders) and design diluents appropriate for different species. - Learn the principles and methods of embryo transfer using artificial semen (Artificial Insemination - AI). - Know methods for collecting eggs from female animals (follicle aspiration, post-slaughter collection, post-surgical collection). - Evaluate the economic and biological benefits of using assisted reproductive techniques. - To know the applications of improving production and preserving endangered breeds (gene banks)..
9. Teaching and Learning Strategies

A– Knowledge	A1 - Understand the basic physiology and anatomy of the male and female reproductive systems. A2 - Know semen collection techniques and explain the scientific principles behind different semen collection methods (massage, artificial vagina, electrical stimulation) and the advantages and disadvantages of each type. A3 - Know oocyte (egg) and embryo transfer techniques. A4 - Analyze the factors affecting the efficiency of different techniques (fertilization rates, insemination).
B – Skills	1. Acquire technical skills in semen collection. 2. Acquire skills in handling eggs (oocytes). 3. Implement embryo handling skills. 4. Acquire skills in biosafety and quality control.
C- Values	1- Scientific integrity and honesty in accurately documenting laboratory results (semen quality, fertilization rates) 2- Sustainability in preserving endangered species (gene bank) 3- Animal welfare 4- Teamwork in promoting collaborative work among veterinarians, researchers, and farmers.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**2theoretical + 3 practical**	**Acquire knowledge and skills**	**Steps for artificial reproduction in carp fish**	**Introductory lecture and discussions about the curriculum**	**Brainstorming**
2	**2 theoretical + 3 practical**	**Student knowledge of reproductive hormones in fish**	**Mothers' Election**	**Presentation, explanation, questions and answers, discussion**	**Quiz Exam**
3	**2 theoretical + 3 practical**	**Knowing the time period between the L.R.H.a dose and ovulation**	**Stages of the maturity period**	**Presentation, explanation, questions and answers, discussion**	**Homework**
4	**2 theoretical + 3 practical**	**Accurate determination of ovulation stage**	**ovulation**	**Presentation, explanation, questions and answers,**	**Quiz Exam**

				discussion	
5	2 theoretical + 3 practical	Mixing eggs and semen in bowls with a bird's feather	Fertilization	Presentation, explanation, questions and answers, discussion	Homework
6	2 theoretical + 3 practical	Effect of water temperature and egg type	incubation and hatching	Presentation, explanation, questions and answers, discussion	brainstorming
7	2 theoretical + 3 practical	Vertical movement of hatched larvae	Isolation of hatched larvae	Presentation, explanation, questions and answers, discussion	Homework
8	2 theoretical + 3 practical	Fingerlings are transferred from earthen basins to larger basins at lower densities.	Fingerling development	Presentation, explanation, questions and answers, discussion	Quiz Exam
9	2 theoretical + 3 practical	Most fish are monogamous.	Reproductive life of fish	Presentation, explanation, questions and answers, discussion	Homework
10	2 theoretical + 3 practical	The process of sperm and semen formation	Production and development of sex gametes	Presentation, explanation, questions and answers, discussion	Quiz Exam
11	2 theoretical + 3 practical	Head, neck, midpiece and tail	Sperm specifications	Presentation, explanation, questions and answers, discussion	Oral questions and answers
12	2 theoretical + 3 practical	There are seven stages of egg development.	Egg development	Presentation, explanation, questions and answers, discussion	Homework
13	2 theoretical + 3 practical	Testicles, epididymis, vas deferens, and vas deferens	male reproductive system of the rooster	Presentation, explanation, questions and answers, discussion	Quiz Exam
14	2 theoretical + 3 practical	Sperm formation, semen composition and characteristics	Sexual maturity in roosters	Introductory lecture and discussions about the curriculum	Homework
15		Androgens and reproductive			brainstorming

	2theoretical +3practical	**hormones**	**Reproductive hormones in roosters**	**Presentation, explanation, questions and answers, discussion**	

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	unavailable
Main references (sources)	Artificial insemination techniques in animals (Dr. Mohamed Fathy Abdel Wahab (Egyptian Universities Publishing House))
Recommended books and references (scientific journals, reports…)	unavailable
Electronic References, Websites	unavailable

Course Description Form

1. Course Name:
Zoonotic diseases
2. Course Code:
ANP 454
3. Semester / Year:
Semester 8 / Year 4
4. Description Preparation Date:
17/7/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
75 hr. \ 3 Units
7. Course administrator's name (mention all, if more than one name)
Name: Yahya Natiq Mohammed Email: yahyanatiq2003@ntu.edu.iq
8. Course Objectives
1. Understanding zoonotic diseases: The study of diseases that can be transmitted between humans and animals. **2. Identifying diseases: Identifying types of zoonotic diseases, such as bacterial, viral, and parasitic diseases.** **3. Studying biological pathogens: Understanding the biological basis of these diseases.** **4. Transmission Methods: Study the ways diseases are transmitted between humans and animals, and vice versa, and between susceptible animals.** **5. Understanding the Health Impact: Understand the health impact of these diseases on humans and animals.** **6. Diagnosis and Treatment: Study the methods of diagnosing and treating these diseases.** **7. Prevention and Control: Learn strategies for preventing and controlling these diseases.**
9. Teaching and Learning Strategies
1. Problem-based learning: Using real-life problems to promote critical thinking and learning. 2. Cooperative learning: Encouraging teamwork and collaboration among students. 3. Field visits: Organizing field visits to health or veterinary centers. 4. Self-directed learning: Encouraging students to engage in independent learning and research.

5. Project-based learning: Encouraging students to work on research projects.
6. Learning through Discussion: Encourage students to participate in discussions and debates.
7. Continuous Assessment: Conduct ongoing assessments throughout the semester.
8. Self-Assessment: Encourage students to evaluate their performance and identify areas for improvement.
9. Additional Resources: Provide additional resources such as books and electronic references.
10. Summative Assessment: Conduct a final assessment at the end of the semester.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The student learns about Zoonotic diseases.	Preface to "Zoonotic Diseases and One Health	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
2	5	The student learns about the mechanisms of disease transmission.	**Mood of transmition**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
3	5	The student learns about the importance of Zoonotic diseases in production and individual health.	**The importance of zonotic diseases**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
4	5	The student can classify Zoonotic	**Farm animal zonotic diseases**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

		diseases of field animals.			
5	5	The student can classify Zoonotic diseases of birds.	**Birds zonotic diseases**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
6	5	The student can classify Zoonotic diseases of cats.	**Cats zonotic diseases**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
7	5	The student can classify Zoonotic diseases of dogs.	**Dogs zonotic diseases**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
8	5	The student can classify Zoonotic diseases of food.	**Foood borne zonotic diseases**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
9	5	The student will learn the details of mad cow disease.	**Mad cow diseases**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
10	5	The student learns about the impact of Zoonotic diseases on public health.	**Poplic health education**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
11	5	The student is asked a series of questions to assess their understandin	**Examination**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

		g.			
12	5	The student learns about a Zoonotic diseases caused by bacteria.	**Bacterial diseases.**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
13	5	The student learns about a Zoonotic diseases caused by fungi.	**Fungal diseases.**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
14	5	The student learns about a Zoonotic diseases caused by parasites.	**Parasitic diseases**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports
15	5	The student learns about the most important preventive measures.	**Controle strategies of diseases.**	Presentation, explanation, questions and answers, discussion	Oral, written and daily practical tests and scientific reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books any)	No curricular books
Main references (sources)	**Zoonotic Diseases and One Health** Special Issue Editors **Marcello Otake Sato** **Megumi Sato** **Poom Adisakwattana** **Ian Kendrich Fontanilla**
Recommended books and	**Zoonotic Diseases and One Health**

references (scientific journals, reports…)	Special Issue Editors **Marcello Otake Sato** **Megumi Sato** **Poom Adisakwattana** **Ian Kendrich Fontanilla**
Electronic References, Websites	**https://www.mdpi.com/books/reprint 2312-zoonotic-diseases-and-one-healt**