

## Course Description Form

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| 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<br>Email: <a href="mailto:yahyanatiq2003@ntu.edu.iq">yahyanatiq2003@ntu.edu.iq</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 8. Course Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <p><b>1. Understanding zoonotic diseases:</b> The study of diseases that can be transmitted between humans and animals.</p> <p><b>2. Identifying diseases:</b> Identifying types of zoonotic diseases, such as bacterial, viral, and parasitic diseases.</p> <p><b>3. Studying biological pathogens:</b> Understanding the biological basis of these diseases.</p> <p><b>4. Transmission Methods:</b> Study the ways diseases are transmitted between humans and animals, and vice versa, and between susceptible animals.</p> <p><b>5. Understanding the Health Impact:</b> Understand the health impact of these diseases on humans and animals.</p> <p><b>6. Diagnosis and Treatment:</b> Study the methods of diagnosing and treating these diseases.</p> <p><b>7. Prevention and Control:</b> Learn strategies for preventing and controlling these diseases.</p> |
| 9. Teaching and Learning Strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <p><b>1. Problem-based learning:</b> Using real-life problems to promote critical thinking and learning.</p> <p><b>2. Cooperative learning:</b> Encouraging teamwork and collaboration among students.</p> <p><b>3. Field visits:</b> Organizing field visits to health or veterinary centers.</p> <p><b>4. Self-directed learning:</b> Encouraging students to engage in independent learning and research.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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 transmission                          | 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 zoonotic 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 zoonotic 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 zoonotic 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 zoonotic 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 zoonotic 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.                        | Food borne zoonotic 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. | Public 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 understanding   | 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.  | Control 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)                 | <b>Zoonotic Diseases and One Health</b><br>Special Issue Editors<br><b>Marcello Otake Sato</b><br><b>Megumi Sato</b><br><b>Poom Adisakwattana</b><br><b>Ian Kendrick Fontanilla</b> |
| Recommended books and                     | <b>Zoonotic Diseases and One Health</b>                                                                                                                                             |

|                                              |                                                                                                                                                                 |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| references (scientific journals, reports...) | Special Issue Editors<br><b>Marcello Otake Sato</b><br><b>Megumi Sato</b><br><b>Poom Adisakwattana</b><br><b>Ian Kendrick Fontanilla</b>                        |
| Electronic References, Websites              | <a href="https://www.mdpi.com/books/reprint/2312-zoonotic-diseases-and-one-health">https://www.mdpi.com/books/reprint/2312-zoonotic-diseases-and-one-health</a> |

## Course Description Form

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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<br>Email: abdalrahman.ba.aw@ntu.edu.iq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 8. Course Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>- The student will understand the scientific basis of the anatomical and functional structure of the reproductive system (male and female).</li> <li>- Learn the physiological processes of spermatogenesis and oogenesis.</li> <li>- Understand the mechanisms of oocyte and sperm maturation and their interaction in the natural fertilization process.</li> <li>- Learn methods for collecting semen from different male animals (massage, artificial vagina, electroporation, surgery).</li> <li>- Master semen quality assessment (volume, color, concentration, motility, vitality, and abnormalities) using a microscope and laboratory instruments.</li> <li>- Understand the principles of semen dilution (semen extenders) and design diluents appropriate for different species.</li> <li>- Learn the principles and methods of embryo transfer using artificial semen (Artificial Insemination - AI).</li> <li>- Know methods for collecting eggs from female animals (follicle aspiration, post-slaughter collection, post-surgical collection).</li> <li>- Evaluate the economic and biological benefits of using assisted reproductive techniques. <ul style="list-style-type: none"> <li>- To know the applications of improving production and preserving endangered breeds (gene banks)..</li> </ul> </li> </ul> |
| 9. Teaching and Learning Strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A- Knowledge</b> | <p>A1 - Understand the basic physiology and anatomy of the male and female reproductive systems.</p> <p>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.</p> <p>A3 - Know oocyte (egg) and embryo transfer techniques.</p> <p>A4 - Analyze the factors affecting the efficiency of different techniques (fertilization rates, insemination).</p> |
| <b>B – Skills</b>   | <p>1. Acquire technical skills in semen collection.</p> <p>2. Acquire skills in handling eggs (oocytes).</p> <p>3. Implement embryo handling skills.</p> <p>4. Acquire skills in biosafety and quality control.</p>                                                                                                                                                                                                                                                                                                           |
| <b>C- Values</b>    | <p>1- Scientific integrity and honesty in accurately documenting laboratory results (semen quality, fertilization rates)</p> <p>2- Sustainability in preserving endangered species (gene bank)</p> <p>3- Animal welfare</p> <p>4- Teamwork in promoting collaborative work among veterinarians, researchers, and farmers.</p>                                                                                                                                                                                                 |

#### 10. Course Structure

| <b>Week</b> | <b>Hours</b>                | <b>Required Learning Outcomes</b>                              | <b>Unit or subject name</b>                    | <b>Learning method</b>                                       | <b>Evaluation method</b> |
|-------------|-----------------------------|----------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|--------------------------|
| 1           | 2 theoretical + 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                |

|    |                                |                                                                                      |                                           |                                                              |                            |
|----|--------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------------------------|----------------------------|
|    |                                |                                                                                      |                                           | <b>discussion</b>                                            |                            |
| 5  | 2 theoretical<br>+ 3 practical | Mixing eggs and semen in bowls with a bird's feather                                 | Fertilization                             | Presentation, explanation, questions and answers, discussion | Homework                   |
| 6  | 2 theoretical<br>+ 3 practical | Effect of water temperature and egg type                                             | incubation and hatching                   | Presentation, explanation, questions and answers, discussion | brainstorming              |
| 7  | 2 theoretical<br>+ 3 practical | Vertical movement of hatched larvae                                                  | Isolation of hatched larvae               | Presentation, explanation, questions and answers, discussion | Homework                   |
| 8  | 2 theoretical<br>+ 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<br>+ 3 practical | Most fish are monogamous.                                                            | Reproductive life of fish                 | Presentation, explanation, questions and answers, discussion | Homework                   |
| 10 | 2 theoretical<br>+ 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<br>+ 3 practical | Head, neck, midpiece and tail                                                        | Sperm specifications                      | Presentation, explanation, questions and answers, discussion | Oral questions and answers |
| 12 | 2 theoretical<br>+ 3 practical | There are seven stages of egg development.                                           | Egg development                           | Presentation, explanation, questions and answers, discussion | Homework                   |
| 13 | 2 theoretical<br>+ 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<br>+ 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              |

|                                                                                                                                                                     |                                     |                 |                                                  |                                                                                                                        |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--|
|                                                                                                                                                                     | <b>2theoretical<br/>+3practical</b> | <b>hormones</b> | <b>Reproductive<br/>hormones in<br/>roosters</b> | <b>Presentation,<br/>explanation,<br/>questions<br/>and answers,<br/>discussion</b>                                    |  |
| <b>11. Course Evaluation</b>                                                                                                                                        |                                     |                 |                                                  |                                                                                                                        |  |
| 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 |                                     |                 |                                                  |                                                                                                                        |  |
| <b>12. Learning and Teaching Resources</b>                                                                                                                          |                                     |                 |                                                  |                                                                                                                        |  |
| 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

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|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Course Name:</b>                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Wild and ornamental animals                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>2. Course Code:</b>                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ANP 451                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>3. Semester / Year:</b>                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Semester                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>4. Description Preparation Date:</b>                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 17/7/2025                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>5. Available Attendance Forms:</b>                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Attendance                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 75 / 3                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>7. Course administrator's name (mention all, if more than one name)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Name: Mohammed Waad Mohammed<br>Email: mohammed.waad88@ntu.edu.iq          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>8. Course Objectives</b>                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Course Objectives</b>                                                   | <ul style="list-style-type: none"> <li>• <b>Awareness of the importance of biodiversity:</b> Understanding the vital role wild and domestic animals play in ecosystems and how they impact ecological balance. 1.</li> <li>• <b>Conservation of endangered species:</b> Identifying threatened species and the causes of their threat, and working to protect them from extinction through conservation and awareness programs. 2.</li> <li>• <b>Environmental education:</b> Promoting environmental awareness among students and the community about the importance of preserving the environment and wildlife, and encouraging sustainable behaviors. 2.</li> <li>• <b>Scientific research and discovery:</b> Encouraging scientific research to understand the behaviors and needs of wild and domestic animals, which helps develop effective strategies for their conservation. 2.</li> <li>• <b>Ecological balance:</b> Understanding how human activities impact wildlife and domestic animals, and working to reduce these negative impacts through sustainable policies and procedures.</li> </ul> |
| <b>9. Teaching and Learning Strategies</b>                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Strategy</b>                                                            | <b>Course Outcomes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>Definition:</b> A set of knowledge, skills, and values that a course seeks to achieve in students.</p> <p><b>Importance:</b> 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.</p> <p><b>How They Are Determined:</b> Course outcomes are determined based on the objectives of the academic program to which the course belongs.</p> |
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## 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<br>Defining the Problem<br>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<br>How<br>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<br>Distribution<br>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<br>Training<br>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<br>Training<br>Education                                                       | Presentation, explanation, questions and answers, discussion | Oral, written and daily practical tests and scientific reports |
| 9    | 5     | hounds                                                            | Types and Care Methods<br>Training<br>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<br>A Book of Wild Animal Management by Prof. Hamid Majeed al-Bayati<br>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:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Poultry Diseases</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. Course Code:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ANP 409                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3. Semester / Year:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Semester <sup>Y</sup> / Year <sup>z</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 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<br>Email: <a href="mailto:yahyanatiq2003@ntu.edu.iq">yahyanatiq2003@ntu.edu.iq</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 8. Course Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p>1. <b>Understanding Poultry diseases:</b> The study of diseases that can be transmitted between the birds .</p> <p>2. <b>Identifying diseases:</b> Identifying types of Poultry diseases, such as bacterial, viral, and parasitic diseases.</p> <p>3. <b>Studying biological pathogens:</b> Understanding the biological basis of these diseases.</p> <p>4. <b>Transmission Methods:</b> Study the ways diseases are transmitted between birds, and between susceptible one.</p> <p>5. <b>Understanding the Health Impact:</b> Understand the health impact of these diseases on birds.</p> <p>6. <b>Diagnosis and Treatment:</b> Study the methods of diagnosing and treating these diseases.</p> <p>7. <b>Prevention and Control:</b> Learn strategies for preventing and controlling these diseases.</p> |
| 9. Teaching and Learning Strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p>1. <b>Problem-based learning:</b> Using real-life problems to promote critical thinking and learning.</p> <p>2. <b>Cooperative learning:</b> Encouraging teamwork and collaboration among students.</p> <p>3. <b>Field visits:</b> Organizing field visits to health or veterinary centers.</p> <p>4. <b>Self-directed learning:</b> Encouraging students to engage in independent</p>                                                                                                                                                                                                                                                                                                                                                                                                                      |

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.                                   | <b>Poultry disease classification</b> | 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. | <b>Mal nutrition diseases</b>         | Presentation, explanation, questions and answers, discussion | Oral, written and daily practical tests and scientific reports |
| 3    | 5     | Students learn about the signs of salmonella.                                         | <b>Diagnosis of salmonellosis</b>     | 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.                | <b>Diagnosis of E.coli</b>            | Presentation, explanation, questions and answers, discussion | Oral, written and daily practical tests and scientific reports |
| 5    | 5     | Students learn about the signs of coryza.                                             | <b>Diagnosis of coryza</b>            | Presentation, explanation, questions and answers, discussion | Oral, written and daily practical tests and scientific reports |
| 6    | 5     | The student learns the signs of CRD.                                                  | <b>Diagnosis of CRD</b>               | 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.                                    | <b>Diagnosis of ND</b>                | Presentation, explanation, questions and answers, discussion | Oral, written and daily practical tests and scientific reports |
| 8    | 5     | The student learns about Camporo disease.                                             | <b>Diagnosis gumboro</b>              | Presentation, explanation, questions and answers, discussion | Oral, written and daily practical tests and scientific reports |
| 9    | 5     | The student learns about bronchitis.                                                  | <b>Diagnosis of IB,ILT</b>            | Presentation, explanation,                                   | Oral, written and daily practical tests                        |

|    |   |                                                                               |                                                  |                                                              |                                                                |
|----|---|-------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------|
|    |   |                                                                               |                                                  | questions and answers, discussion                            | and scientific reports                                         |
| 10 | 5 |                                                                               | <b>Diagnosis Neoplasma</b>                       | 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.            | <b>Diagnosis of parasitic diseases</b>           | 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. | <b>Traning for pharmacolgicl preperation</b>     | 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.       | <b>Types of vaccine and vaccination methodes</b> | 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.               | <b>Diagnosis of fungal diseases</b>              | 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.                     | <b>Diagnosis of mark disease</b>                 | 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)                                          | <b>Poultry Diseases" by Pattison, which is currently in its sixth edition</b>                                                  |
| 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                                    | <a href="https://www.poultryworld.net/health-tool/">https://www.poultryworld.net/health-tool/</a>                              |

## 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:                                                                                                                                                                                                                                                                                 |         |                                                                                               |                                                                                                          |                                                                        |                                                                       |
| 90 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:                                                                                                                                                                                                                                                                           |         |                                                                                               |                                                                                                          |                                                                        |                                                                       |
| <ul style="list-style-type: none"> <li>Discussion and dialogue strategy</li> <li>Brainstorming</li> <li>Self-learning</li> <li>Group collaborative assignments</li> <li>Report writing task</li> </ul>                                                                                                         |         |                                                                                               |                                                                                                          |                                                                        |                                                                       |
| 10.Course Structure:                                                                                                                                                                                                                                                                                           |         |                                                                                               |                                                                                                          |                                                                        |                                                                       |
| Week                                                                                                                                                                                                                                                                                                           | Hours   | Required Learning Outcomes                                                                    | Unit or subject name                                                                                     | Learning method                                                        | Evaluation method                                                     |
| 1                                                                                                                                                                                                                                                                                                              | 5 Hours | B.The student should <b>explain</b> the anatomical and functional differences between species | Development of the stomach and intestines during the animal's life stages; comparison between ruminants, | 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 <b>analyze</b> feeding behavior and the role of saliva in digestio            | Feed intake, chewing, animal behavior during feeding and suckling<br>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 <b>describe</b> the feed 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 <b>evaluate</b> 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 <b>compare</b> 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 <b>explain</b> the mechanism of nutrient transport in poultr                  | Movement of nutrients within the digestive system of poultry<br>Factors 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 <b>explain</b> 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 <b>apply</b> absorption concepts and <b>analyze</b> 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 <b>understand</b> 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 <b>distinguish</b> 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 <b>design</b> 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 Nutri<br>by D. C. Church |

## Course Description Form

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                       |                                            |                             |                            |                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------|-----------------------------|----------------------------|--------------------------|
| <b>1.Course Title:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       |                                            |                             |                            |                          |
| Feed Manufacturing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                       |                                            |                             |                            |                          |
| <b>2.Course Code:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                       |                                            |                             |                            |                          |
| ANP407                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       |                                            |                             |                            |                          |
| <b>3.Level / Academic Year:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                       |                                            |                             |                            |                          |
| Fourth Year / 2024-2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                                            |                             |                            |                          |
| <b>4. Date of Description Preparation:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |                                            |                             |                            |                          |
| 17/07/2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |                                            |                             |                            |                          |
| <b>5.Available Attendance Modes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |                                            |                             |                            |                          |
| In-person                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                       |                                            |                             |                            |                          |
| <b>6.Total Credit Hours / Units:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |                                            |                             |                            |                          |
| 60 hours (1 theoretical + 3 practical) × 15 weeks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |                                            |                             |                            |                          |
| <b>7.Course Coordinator (All names if multiple):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |                                            |                             |                            |                          |
| Name: Haneen Mowfak Ahmed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                       |                                            |                             |                            |                          |
| Email: <a href="mailto:Haneen.mowfak@ntu.edu.iq">Haneen.mowfak@ntu.edu.iq</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       |                                            |                             |                            |                          |
| <b>8. Course Objectives:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                            |                             |                            |                          |
| <ol style="list-style-type: none"> <li>1. Understand the processes and principles of feed manufacturing, including the selection of suitable raw materials and the procedures of mixing and processing.</li> <li>2. Acquire knowledge about nutritional value and balanced feeding for animals, and how to achieve it through feed formulation.</li> <li>3. Apply safety and quality principles in feed manufacturing processes, including proper storage and safe, efficient transportation.</li> <li>4. Understand the types of dietary supplements and various additives that can be included in feed and their impact on animal health and productivity.</li> <li>5. Evaluate the quality and nutritional value of feed.</li> </ol> |                       |                                            |                             |                            |                          |
| <b>9. Teaching and Learning Strategies:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                       |                                            |                             |                            |                          |
| <ul style="list-style-type: none"> <li>• Discussion and dialogue strategy</li> <li>• Brainstorming</li> <li>• Self-learning</li> <li>• Group collaborative assignments</li> <li>• Report writing task</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                       |                                            |                             |                            |                          |
| <b>10.Course Structure:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                       |                                            |                             |                            |                          |
| <b>Week</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Hours</b>          | <b>Required Learning Outcomes</b>          | <b>Unit or subject name</b> | <b>Learning method</b>     | <b>Evaluation method</b> |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4 Hours<br>(1Theory+3 | <b>D.H1:</b> The student should be able to | Management and              | Presentation, explanation, | Oral, written and        |

|    |                                      |                                                                                                              |                                                                                  |                                                                        |                                                                       |
|----|--------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------|
|    | 3 Practical)                         | analyze the stages of feed manufacturing organization and evaluate their efficiency                          | Organization of Feed Manufacturing Operations                                    | Q&A, interactive discussion, self-learning.                            | practical daily assessments and scientific reports.                   |
| 2  | 4 Hours<br>(1Theory+3<br>3 Practical | <b>B.D1:</b> 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<br>(1Theory+3<br>3 Practical | <b>C3:</b> 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<br>(1Theory+3<br>3 Practical | <b>C.W4:</b> 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<br>(1Theory+3<br>3 Practical | <b>.H4:</b> 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<br>(1Theory+3<br>3 Practical | <b>B.H6:</b> 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<br>(1Theory+3<br>3 Practical | <b>C7:</b> 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<br>(1Theory+3<br>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<br>(1Theory+3<br>3 Practical | <b>C3:</b> 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<br>(1Theory+3<br>3 Practical | <b>C.D3:</b> 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<br>(1Theory+3                | <b>A.H6:</b> 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<br>(1Theory+3<br>3 Practical | <b>A.H7:</b> 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<br>(1Theory+3<br>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<br>(1Theory+3<br>3 Practical | <b>B2:</b> 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<br>(1Theory+3<br>3 Practical | <b>B.D6:</b> 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 Name:                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Genital diseases and obstetrics</b>                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 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<br>Email: <a href="mailto:yahyanatiq2003@ntu.edu.iq">yahyanatiq2003@ntu.edu.iq</a> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 8. Course Objectives                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Course Objectives                                                                                             | <ol style="list-style-type: none"> <li>1. Understand Reproductive Anatomy and Physiology: Learn the normal structure and function of the male and female reproductive systems in domestic animals.</li> <li>2. Diagnose Genital Diseases: Identify common infectious, inflammatory, neoplastic, and congenital diseases affecting the reproductive tract.</li> <li>3. Manage Obstetric Conditions: Understand the stages of normal parturition (eutocia) and recognize dystocia (difficult birth) in various species.</li> <li>4. Prevent and Control Reproductive Disorders: Study breeding management, biosecurity.</li> </ol> |
| 9. Teaching and Learning Strategies                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Strategy                                                                                                      | <p>Course Outcomes</p> <p>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</p>                                                                                                                                                                                                                                                                                                                                                |

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 (curriculum books, if any)                      | <b>Bovine Reproduction</b>                              |
| Main references (sources)                                          |                                                         |
| Recommended books and references (scientific journals, reports...) | <b>Merck Veterinary Manual – Reproductive Disorders</b> |

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 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<br>Email: dqasm0478@ntu.edu.iq               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 8. Course Objectives                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Course Objectives</b>                                            | <p><b>1. Technical and Practical Knowledge:</b><br/>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.</p> <p><b>2. Development of Applied Skills:</b><br/>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.</p> <p><b>3. Enhancement of Production Efficiency:</b><br/>Teach students how to improve productivity by applying best practices in field management, including the use of modern technologies and agricultural data analysis.</p> |
| 9. Teaching and Learning Strategies                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Strategy</b>                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## 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 Management                               | 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 analysis |
| 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 exam                    |
| 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 (curriculum books, if any)                      | Available                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Main references (sources)                                          | <p>Concept of Farm Management: Objectives and Duties Dr. Hashim Al-Alwan Al-Samara'i</p> <p>Science of Farm Management and Economic Foundations Dr. Hashim Al-Alwan Al-Samara'i</p> <p>Farm Revenues Dr. Hashim Al-Alwan Al-Samara'i</p>                                                                                                                                                                                                                                           |
| Recommended books and references (scientific journals, reports...) | <ol style="list-style-type: none"> <li><b>Agricultural Marketing – Concepts and Farm Management and Agricultural Extension – Part One</b> College of Agriculture Library, University of Al-Qadisiyah (agr.qu.edu.iq)</li> <li><b>Natural Pasture Management</b> Dr. Ramadan Ahmed Al-Tikriti et al.; College of Agriculture, University of Al-Qadisiyah (agr.qu.edu.iq)</li> <li><b>Farm Management</b> George Frederick Waugh; Noor Electronic Library (noor-book.com)</li> </ol> |
| Electronic Websites                                                | <p>References, <a href="https://www.youtube.com/channel/UCwC-E-UQXZpk2HaLzC2e1Eg">https://www.youtube.com/channel/UCwC-E-UQXZpk2HaLzC2e1Eg</a></p> <p><a href="https://www.youtube.com/watch?v=1nb6H3nW1fM">https://www.youtube.com/watch?v=1nb6H3nW1fM</a></p>                                                                                                                                                                                                                    |

## 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<br>Email: <a href="mailto:wasseem_amer@ntu.edu.iq">wasseem_amer@ntu.edu.iq</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 8. Course Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>1. Students will be able to apply the concepts and theories acquired in practical situations related to beef cattle production.</li> <li>2. Students will analyze and evaluate various aspects of beef cattle production to improve production efficiency and quality.</li> <li>3. Students will be able to identify and diagnose diseases and health problems that may face beef cattle.</li> <li>4. Students will apply modern tools and technologies to improve production processes and increase productivity.</li> <li>5. Students will be able to develop effective strategies for successfully marketing meat products.</li> </ul> |
| 9. Teaching and Learning Strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p><b>Strategies</b></p> <p>1. <b>Project-Based Learning:</b> Students are assigned to design a project to manage a beef production unit or develop a feeding plan to improve carcass quality.</p> <p>2. <b>Field Studies and Practical Visits:</b> Organizing trips to beef cattle farms or slaughter and food</p>                                                                                                                                                                                                                                                                                                                                                                                              |

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.                                                                                                                     |  |  |  |
| <b>11. Course Evaluation</b>                                                                                                                                        |  |                                                                                                                           |  |  |  |
| 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 |  |                                                                                                                           |  |  |  |
| <b>12. Learning and Teaching Resources</b>                                                                                                                          |  |                                                                                                                           |  |  |  |
| Required textbooks (curricular books, if any)                                                                                                                       |  | Meat Animal Production<br>Meat Cattle Production                                                                          |  |  |  |
| Main references (sources)                                                                                                                                           |  | By Mohammad Reza Anawi,<br>Dr. Fouad Abdul Latif Abdul Karim                                                              |  |  |  |
| Recommended books and references (scientific journals, reports...)                                                                                                  |  | Beef Cattle Raising for Dummies Paperback – Illustrated, July 3, 2012<br><br>By Scott Royer (Author) Nicky Royer (Author) |  |  |  |
| Electronic References, Websites                                                                                                                                     |  | <a href="https://almerja.net/reading.php?idm=48213">https://almerja.net/reading.php?idm=48213</a>                         |  |  |  |

## 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<br>Email: <a href="mailto:mddazz84@ntu.edu.iq">mddazz84@ntu.edu.iq</a> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 8. Course Objectives                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Course Objectives                                                                                    | <p>1. Understand reproductive anatomy/physiology (estrous cycles, ovulation, gamete biology).</p> <p>2. Learn hormonal control for estrus synchronization.</p> <p>2. Develop Technical AI/ET Skills: Perform semen collection/evaluation (CASA, microscopy). Practice AI techniques (vaginal, cervical, surgical) in key species (cattle, sheep, horses).</p> <p>3. Implement Reproductive Technologies: Apply cryopreservation (semen/embryo freezing).</p> <p>4. Ensure Ethical &amp; Efficient Management Follow biosecurity/welfare protocols. And Optimize breeding programs for genetic improvement.</p>                  |
| 9. Teaching and Learning Strategies                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Strategy                                                                                             | <p>Course Outcomes</p> <p>Definition <b>Veterinary Embryo Transfer (ET) and Artificial Insemination (AI)</b> 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 <b>explain key concepts of reproductive physiology</b>, including estrous cycles, hormonal regulation (such as PGF2<math>\alpha</math>, eCG, and GnRH protocols), and factors affecting fertility in domestic animals. They will gain <b>hands-on proficiency in AI techniques</b>, covering semen collection,</p> |

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 Recent 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 books if any)                       | <b>"Manual of the International Embryo Transfer Society (IETS)</b>                                                                                                                                                                                                                                                                                                                                                                                                        |
| Main references (sources)                                          | <ul style="list-style-type: none"> <li>Schoolcraft, W. B., et al. (2001). "Embryo transfer: techniques and variables affecting success." <b>Fertility and Sterility</b>, 76(5), 863-870.</li> </ul> <p>Brown, J. A., et al. (2016). "Ultrasound-guided embryo transfer improves pregnancy rates." <i>Human Reproduction</i>, 31(5), 1011-1018.</p>                                                                                                                        |
| Recommended books and references (scientific journals, reports...) | Textbook of Poultry Production and Management, Dr. Girraj Goyal                                                                                                                                                                                                                                                                                                                                                                                                           |
| Electronic References, Websites                                    | <a href="https://www.eshre.eu/Guidelines-and-Legal/Guidelines/IVF-in-routine-care">https://www.eshre.eu/Guidelines-and-Legal/Guidelines/IVF-in-routine-care</a><br><a href="https://www.fertstert.org/article/S0015-0282(16)61299-8/fulltext">https://www.fertstert.org/article/S0015-0282(16)61299-8/fulltext</a><br><a href="https://www.rbmojournal.com/article/S1472-6483(20)30007-5/fulltext">https://www.rbmojournal.com/article/S1472-6483(20)30007-5/fulltext</a> |

## Course Description Form

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                       |                                                                    |                                                    |                                             |                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------|---------------------------------------------------|
| <b>1.Course Title:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       |                                                                    |                                                    |                                             |                                                   |
| poultry Breeding and Improvement                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                       |                                                                    |                                                    |                                             |                                                   |
| <b>2.Course Code:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |                                                                    |                                                    |                                             |                                                   |
| ANP356                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       |                                                                    |                                                    |                                             |                                                   |
| <b>3.Level / Academic Year:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                       |                                                                    |                                                    |                                             |                                                   |
| Third Year / 2024–2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       |                                                                    |                                                    |                                             |                                                   |
| <b>4.Date of Description Preparation:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                       |                                                                    |                                                    |                                             |                                                   |
| 17/07/2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       |                                                                    |                                                    |                                             |                                                   |
| <b>5.Available Attendance Modes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                       |                                                                    |                                                    |                                             |                                                   |
| In-person                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                       |                                                                    |                                                    |                                             |                                                   |
| <b>6.Total Credit Hours / Units:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                       |                                                                    |                                                    |                                             |                                                   |
| 60 hours (1 theoretical + 3 practical) × 15 weeks/3                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                       |                                                                    |                                                    |                                             |                                                   |
| <b>7.Course Coordinator (All names if multiple):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                       |                                                                    |                                                    |                                             |                                                   |
| Name: Haneen Mowfak Ahmed                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                       |                                                                    |                                                    |                                             |                                                   |
| Email: <a href="mailto:Haneen.mowfak@ntu.edu.iq">Haneen.mowfak@ntu.edu.iq</a>                                                                                                                                                                                                                                                                                                                                                                                                                        |                                       |                                                                    |                                                    |                                             |                                                   |
| <b>8. Course Objectives:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       |                                                                    |                                                    |                                             |                                                   |
| <ul style="list-style-type: none"> <li>Understand the methods of breeding and improvement of farm animals.</li> <li>Gain knowledge about ways to enhance animal productivity in terms of meat and milk.</li> <li>Learn about the history and development of animal breeding and improvement sciences, including theories of evolution.</li> <li>Understand selection methods and tools.</li> <li>Enhance student skills regarding methods of increasing agricultural animal productivity.</li> </ul> |                                       |                                                                    |                                                    |                                             |                                                   |
| <b>9. Teaching and Learning Strategies:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                       |                                                                    |                                                    |                                             |                                                   |
| <ul style="list-style-type: none"> <li>Discussion and dialogue strategy</li> <li>Brainstorming</li> <li>Self-learning</li> <li>Group collaborative assignments</li> <li>Report writing task</li> </ul>                                                                                                                                                                                                                                                                                               |                                       |                                                                    |                                                    |                                             |                                                   |
| <b>10.Course Structure:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                       |                                                                    |                                                    |                                             |                                                   |
| <b>Week</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Hours</b>                          | <b>Required Learning Outcomes</b>                                  | <b>Unit or subject name</b>                        | <b>Learning method</b>                      | <b>Evaluation method</b>                          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4 Hours<br>(1Theory+3<br>3 Practical) | Theory: A1.<br>Understand statistical principles related to animal | Theory:<br>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.<br>Practical: A1. Recall and understand statistical calculations related to animal breeding and improvement.                      | animal breeding.<br>Practical: Measures of dispersion and central tendency                                                  | discussion, self-learning.                                             | scientific reports.                                                   |
| 2 | 4 Hours<br>(1Theory+3<br>3 Practical | Theory: B1. Explain major gene expression patterns and gene types.<br>Practical: A2. Understand regression and correlation coefficients                                                           | Theory: Gene expression patterns and genetic principles in breeding.<br>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<br>(1Theory+3<br>3 Practical | Theory: A3. Explain gene frequency in the case of single or multiple gene pairs.<br>Practical: C3. Apply calculations of gene and allele frequencies.                                             | Theory: Gene frequency and mating types.<br>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<br>(1Theory+3<br>3 Practical | Theory: A4. Identify factors affecting gene frequency such as drift, migration, mutation, and selection.<br>Practical: C3. Apply calculations for gene frequency and analyze influencing factors. | Theory: Factors affecting gene frequency.<br>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<br>(1Theory+3<br>3 Practical | Theory: A4. Explain the relationship between reproduction and breeding.<br>Practical: C4. Measure reproductive traits.                                                                            | Theory: Reproduction and its rates in animals.<br>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<br>(1Theory+3<br>3 Practical | Theory: A5. Differentiate between types of                                                                                                                                                        | Theory: Types of selection - natural and                                                                                    | Presentation, explanation, Q&A,                                        | Oral, written and practical                                           |

|    |                                     |                                                                                                                                                           |                                                                                                                          |                                                                        |                                                                      |
|----|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------|
|    |                                     | selection.<br>Practical: C5. Analyze selection data.<br>B2. Collaborate in group work.                                                                    | artificial.<br>Practical: Types of selection                                                                             | interactive discussion, self-learning.                                 | daily assessments and scientific reports                             |
| 7  | 4 Hours<br>(1 Theory + 3 Practical) | Theory: A6. Explain the concept of heritability and relationship among relatives.<br>Practical: C4. Use and apply heritability rates and kinship formulas | Theory: Heritability, variance analysis, and relationships among relatives.<br>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<br>(1 Theory + 3 Practical) | Evaluate student comprehension                                                                                                                            | First Midterm Exam (Theory).                                                                                             | Presentation, explanation, Q&A, interactive discussion, self-learning. | Written examination                                                  |
| 9  | 4 Hours<br>(1 Theory + 3 Practical) | Theory: B3. Explain breeding based on genetic and phenotypic similarity.<br>Practical: C4. Calculate inbreeding and outbreeding coefficients.             | Theory: Types of breeding (inbreeding, outbreeding, line breeding).<br>Practical: Types of breeding.                     | Presentation, explanation, Q&A, interactive discussion, self-learning. | Oral, written and practical daily assessments and scientific reports |
| 10 | 4 Hours<br>(1 Theory + 3 Practical) | Theory: A3. Understand main types of crossbreeding.<br>Practical: C2. Evaluate improvement rates.                                                         | Theory: Types of crossbreeding.<br>Practical: Hardy-Weinberg Law.                                                        | Presentation, explanation, Q&A, interactive discussion, self-learning. | Oral, written and practical daily assessments and scientific reports |
| 11 | 4 Hours<br>(1 Theory + 3 Practical) | Theory: C6. Define genetic equivalence and genetic parameters.<br>Practical: C5. Write and interpret a report on genetic equivalence and parameters.      | Theory: Genetic parameters in animal herds.<br>Practical: Genetic equivalence                                            | Presentation, explanation, Q&A, interactive discussion, self-learning. | Oral, written and practical daily assessments and scientific reports |
| 12 | 4 Hours<br>(1 Theory + 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<br>(1Theory+3<br>3 Practical) | Evaluate student comprehension                                                                                                                           | Second Midterm Exam (Practical).                                                                                               | Presentation, explanation, Q&A, interactive discussion, self-learning. | Written examination                                                  |
| 14 | 4 Hours<br>(1Theory+3<br>3 Practical) | Theory: B2. Explain the concept of selection intensity and genetic correlation.<br>Practical: C7. Calculate genetic correlation and selection intensity. | Theory: Genetic correlation, selection intensity, and genetic selection.<br>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<br>(1Theory+3<br>3 Practical) | Theory: B6. Explain animal records and modern approaches in animal breeding and improvement.<br>Practical: C8. Present a proposed project                | Theory: Animal records and improvement projects in Iraq.<br>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<br><br>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:

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

## 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 | <ul style="list-style-type: none"> <li>• Concept of Market and Agricultural Marketing</li> </ul>   | Understanding the definition of market and agricultural marketing, and distinguishing between them.                           | Theoretical lectures, class discussions, practical examples.                                        | Quizzes, essay questions                                                                                      |
| 2    | 2 Theory | <ul style="list-style-type: none"> <li>• Importance of Agricultural Marketing Processes</li> </ul> | Analyzing the role of marketing processes in improving the distribution of agricultural products.                             | <ul style="list-style-type: none"> <li>• Case studies, presentations, group discussions.</li> </ul> | Analytical reports, presentation evaluations                                                                  |
| 3    | 2 Theory | <ul style="list-style-type: none"> <li>• Objectives of Agricultural Marketing</li> </ul>           | Identifying the main objectives of agricultural marketing, such as increasing efficiency and achieving consumer satisfaction. | Interactive lectures, workshops.                                                                    | <ul style="list-style-type: none"> <li>• Written exams, research projects</li> </ul>                          |
| 4    | 2 Theory | Research Methodologies in Marketing Studies                                                        | Familiarizing with quantitative and qualitative methodologies in agricultural marketing research.                             | Practical lessons, analysis of previous studies.                                                    | <ul style="list-style-type: none"> <li>• Research paper submission, critical evaluation of studies</li> </ul> |
| 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 | <ul style="list-style-type: none"> <li>• Functions and Facilitative Services</li> </ul>            | 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.                    | <ul style="list-style-type: none"> <li>• Lectures, case studies, discussions.</li> </ul>            | <ul style="list-style-type: none"> <li>• Written exams, analytical reports</li> </ul>                         |
| 8    | 2 Theory | Midterm Exam 1                                                                                     | Conducting a                                                                                                                  | <ul style="list-style-type: none"> <li>• Comprehensive</li> </ul>                                   | <ul style="list-style-type: none"> <li>• Comprehensive</li> </ul>                                             |

|    |          |                                       |                                                                                                         |                                              |                                              |
|----|----------|---------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------|
|    |          |                                       | 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)                                          | <b>Agricultural Marketing</b><br>Author: Dr. Talal Hussein Al-Shammari<br>Publisher: Dar Al-Thaqafa for Publishing and Distribution – Amman<br>Edition: Multiple editions available (between 2005–2015)                                                                           |
| Recommended books and references (scientific journals, reports...) | <ol style="list-style-type: none"> <li><b>1. Agricultural Marketing – Concepts and Applications</b></li> <li><b>2. Dr. Adnan Jawad Al-Tama</b></li> <li><b>3.</b></li> <li><b>4. Principles of Agricultural Marketing</b></li> <li><b>5. Dr. Khalil Ibrahim Al-Daw</b></li> </ol> |
| Electronic References, Websites                                    | <a href="https://www.youtube.com/watch?v=1l8EWaSfzmc">https://www.youtube.com/watch?v=1l8EWaSfzmc</a>                                                                                                                                                                             |

### 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<br>amyl: <a href="mailto:zahraa@ntu.edu.iq85">zahraa@ntu.edu.iq85</a>                                                                                                                                                                                                                                                                                                                                                                                   |                           |
| 8. Course objectives:                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |
| <p><b>Aims</b> The decision to supply students With knowledge and skills necessary For design experiments Scientific Effective and analysis Its results Using Methods Statistics.</p> <p><b>identification</b> 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.</p> | <b>Course objectives:</b> |
| 9. Teaching and learning strategies:                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                           |
| 1- Interactive lecture<br>2- Brainstorming                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Strategy:</b>          |

| 3- Dialogue and discussion<br>4- Writing on the board<br>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<br>Most important Rules Basic in design and analysis experiments                    | 1- That learn The student Concepts Basic Private By design experiments .<br>2-The student understands the basic rules of design.<br>3-The student should be familiar with all the terms related to design and analysis of experiments.<br>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<br>1- Design features<br>2- Design defects<br>3- Analysis of variance | 1- That He knows The student sources difference existing in Design<br>2- That understand The student How to Find table analysis Contrast<br>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.<br>2-that He works The                                                                                                                                                                        | 4       | 3    |

|                                                          |                                               |                                                                                                                          |                                                                                                                                                                                                                                                                        |   |   |
|----------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|
| <b>Solutions</b>                                         |                                               |                                                                                                                          | student on Continue in collection Views until Lost Most of them.                                                                                                                                                                                                       |   |   |
| <b>Test + Questions and Answers + Exercise Solutions</b> | 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<br>2-The student should know the sources of variation in design.<br>3-that understand The student How to application Design in experience.<br>4-that learn The student How to Find table analysis Contrast. | 4 | 4 |
| <b>Test + Questions and Answers + Exercise Solutions</b> | Lecture + Presentation                        | analysis Contrast , to set number duplicates , appreciation value The missing(or more)in Sectors                         | 1- The student can find the missing value.<br>2-that can from analysis Results And its application Field.                                                                                                                                                              | 4 | 5 |
| <b>Test + Questions and Answers + Exercise Solutions</b> | 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.<br>2-The student should know the sources of variation in design.<br>3- The student understands how to apply the design in the experiment.<br>4-The student learns how to find an analysis of variance table.  | 4 | 6 |
| <b>Test +</b>                                            | Lecture +                                     | efficiency design                                                                                                        | knowledge The student                                                                                                                                                                                                                                                  | 4 | 7 |

|                                                          |                        |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |    |
|----------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|
| <b>Questions and Answers + Exercise Solutions</b>        | 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  |
| <b>Test + Questions and Answers + Exercise Solutions</b> | Lecture + Presentation | Diagnosis Moral Differences between Averages Arithmetic ,1- Comparisons Independent                      | -1 The student learns the testing method.<br>- 2 The student should understand when the test is conducted, before or after the experiment.<br>3- The student should know when to use this test, when the factor is quantitative or qualitative.<br>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 |

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

|                                                          |                        |                     |                                                                                                                                                                                                                                                             |   |    |
|----------------------------------------------------------|------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|
|                                                          |                        |                     | to divide experience to Levels different.                                                                                                                                                                                                                   |   |    |
| <b>Test + Questions and Answers + Exercise Solutions</b> | Lecture + Presentation | Regression analysis | 1-The student understands the relationship between the dependent and independent variables.<br>2-The student understands the extent of the effect of each independent variable on the dependent variable.<br>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:                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 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: <a href="mailto:fahadbiology@ntu.edu.iq">fahadbiology@ntu.edu.iq</a> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 8. Course Objectives                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Course Objectives                                                           | <p>By the end of the course, the student is expected to be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the concept of scientific research, its objectives, and its importance in solving scientific and applied problems.</li> <li>2. Distinguish between different types of research and scientific methodologies, and select the appropriate methodology for their research topic.</li> <li>3. Select and formulate a clear research problem, defining suitable objectives and hypotheses.</li> <li>4. Search reliable scientific sources and references, and prepare a structured literature review.</li> <li>5. Design a comprehensive scientific research plan according to sound methodological principles.</li> <li>6. Select and practically apply the appropriate data collection tool.</li> <li>7. Analyze data using appropriate statistical methods and analysis software.</li> </ol> |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                              |                                                                                                                                                                                                           |                                            |                                        |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------|
|                                     | <div>8. Discuss results, relate them to objectives and hypotheses, and provide practical, scientific recommendations.</div> <div>9. Write the scientific research in correct academic style, adhering to research ethics and proper referencing.</div> <div>10. Prepare a publishable research paper for submission to a peer-reviewed scientific journal and present it formally.</div> |                                                                                                                                                                                                                              |                                                                                                                                                                                                           |                                            |                                        |
| 9. Teaching and Learning Strategies |                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                              |                                                                                                                                                                                                           |                                            |                                        |
| Strategy                            | <div>1. Interactive lectures</div> <div>2. Project-based learning</div> <div>3. Teamwork</div> <div>4. Problem-based learning</div> <div>5. Practical workshops</div> <div>6. Presentations and classroom discussions</div> <div>7. Blended e-learning</div>                                                                                                                             |                                                                                                                                                                                                                              |                                                                                                                                                                                                           |                                            |                                        |
| 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. | <b>Introduction to Scientific Research:</b><br>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. | <b>Types of Research:</b> 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.                                 | <b>Choosing a Research Topic and Formulating the Problem:</b> 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                  | <b>Formulating Research Objectives and Hypotheses:</b><br>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.      | <b>Scientific Sources:</b> 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.                        | <b>Review of Previous Studies:</b> 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. | <b>Research Methodologies and Data Collection Tools:</b> 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.               | <b>Designing the Research Plan:</b> 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.     | <b>Population and Sampling:</b> 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. | <b>Data Analysis and Results Presentation:</b> 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.          | <b>Discussion of Results and Recommendations:</b><br>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.                | <b>Scientific Research Writing in Academic Format:</b><br>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 | <b>Scientific Publishing in Peer-Reviewed Journals:</b> 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. | <b>Student Research Presentations and Discussions:</b><br>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.                                                                 | <b>Final Evaluation</b>                                                                                                                                                     | Final exam                                | Final exam + final project evaluation                      |
| 11. Course Evaluation                                                                             |   |                                                                                                                                                                            |                                                                                                                                                                             |                                           |                                                            |
| (Grade out of 100)                                                                                |   |                                                                                                                                                                            |                                                                                                                                                                             |                                           |                                                            |
| 1. Classroom participation and weekly activities: 10%<br>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,<br>Professor Dr. Iyad Youssef Al-Hajj Ismail,<br>First Edition, 2019. |
| Recommended books and references (scientific journals, reports...) |                                                                                                                                          |
| Electronic References, Websites                                    |                                                       |