

FACULTY OF AGRICULTURAL SCIENCES
UNIVERSITY OF THE PUNJAB, LAHORE

Programme	B.Sc. (Hons.) Agriculture	Course Code	AH-201	Credit Hours	3(2-1)
Course Title	INTRODUCTION TO ANIMAL HUSBANDRY				
Course Introduction					
<p>The course provides a comprehensive exploration of livestock management, covering key aspects essential for understanding and effectively managing animals in agricultural settings. It begins with an overview of the historical significance of livestock and their vital role in human society. The course then examines current livestock population trends and distributions worldwide.</p> <ul style="list-style-type: none"> • Students will gain insight into the various products derived from livestock and their economic and nutritional importance. The process of domestication and zoological classification of animals is discussed to provide a foundational understanding of their evolutionary development and genetic relationships. • A focus on terminology common in animal husbandry ensures students are proficient in industry-specific language and concepts. Principles of livestock management are reviewed, emphasizing best practices in handling, feeding, housing, and healthcare to optimize animal welfare and productivity. • Practical skills in maintaining farm records are emphasized, highlighting the importance of systematic data collection for informed decision-making. Livestock housing design and management principles are explored, considering factors that influence animal health and behavior. • The course covers the composition of milk from various species and the production of milk products, as well as standards and techniques for transporting and ensuring the welfare of farm animals. • Detailed exploration of the poultry industry includes an examination of poultry classes, breeds, and their distinctive characteristics. Practical aspects such as the selection, care, and management of hatching eggs, as well as the operation of incubators and brooders, are also addressed. • Genetics principles are introduced, focusing on their role in animal breeding programs to improve desirable traits. This includes an in-depth study of various livestock breeds, their characteristics, and their suitability for different agricultural purposes. 					

- Students will study the reproductive biology of livestock, covering topics such as the reproductive cycle, age at puberty, gestation periods, and factors affecting fertility and artificial breeding techniques.
- The course also addresses biotechnological advances in animal breeding and genetics, highlighting their potential impact on livestock productivity and genetic diversity. Basic principles of animal nutrition are discussed, including feed classification, feeding standards, and nutrient evaluation for different animal categories.

Overall, the course prepares students with a comprehensive understanding of animal husbandry practices, equipping them for roles in livestock management, agriculture, and related fields where animal welfare, productivity, and sustainability are crucial considerations.

Learning Outcomes

The course aims to equip students with a comprehensive understanding of various aspects related to the management and care of livestock. By the end of the course, students are expected to achieve the following learning outcomes:

1. **Historical Context and Importance:** Understand the historical significance of livestock in human civilization and appreciate their economic and cultural importance.
2. **Livestock Population and Distribution:** Analyze current trends in livestock populations globally and regionally, and understand their implications for agriculture and food security.
3. **Livestock Products:** Identify and evaluate the diverse range of products obtained from livestock, including meat, milk, and other by-products, and understand their nutritional and economic significance.
4. **Domestication and Zoological Classification:** Explore the process of domestication of animals and classify them based on their evolutionary relationships and genetic diversity.
5. **Terminology and Management Principles:** Acquire knowledge of common terminology used in animal husbandry and review the principles of effective livestock management, emphasizing best practices in feeding, housing, and healthcare.
6. **Farm Records:** Demonstrate the ability to maintain accurate farm records for informed decision-making in livestock operations.
7. **Livestock Housing:** Evaluate different housing designs for livestock based on species-specific requirements and environmental considerations.
8. **Milk Composition and Products:** Analyze the gross composition of milk from various species and understand the processing and utilization of milk products.
9. **Transportation and Welfare:** Implement strategies for the safe transportation and ensure the

welfare of farm animals during transit.

10. **Poultry Industry:** Assess the significance of the poultry industry, including the classification, breeds, and characteristics of poultry species, and their role in food production.
11. **Hatching Egg Management:** Apply criteria for selecting, caring, and storing hatching eggs, and demonstrate proficiency in operating incubators and brooders.
12. **Genetics and Breeding:** Introduce basic genetic concepts and their application in animal breeding to improve desirable traits in livestock populations.
13. **Livestock Breeds:** Classify and compare breeds of livestock and milch animals, including draught and dual-purpose cattle, buffalo, sheep, and goats.
14. **Reproductive Biology:** Examine the reproductive cycle, age at puberty, gestation periods, and factors affecting fertility and artificial breeding techniques.
15. **Nutrition Principles:** Understand fundamental principles of animal nutrition, including the classification of feeds, feeding standards, and nutrient evaluation for different physiological states of animals.
16. **Rumen Function:** Explore the role of rumen microflora in the digestion of cellulose and urea in ruminants, and identify factors influencing nutrient absorption and utilization.

Overall, this course prepares students with a comprehensive foundation in animal husbandry, covering theoretical knowledge and practical skills necessary for effective management and sustainable practices in livestock production.

Course Content		Assignments/Readings
Week 1	<p><u>THEORY</u></p> <p>Lecture 1: Brief History and Importance of Livestock</p> <p>Lecture 2: Livestock Population</p>	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 1. ○ Shah, S.I. (Ed.) (1994). Animal Husbandry. Chapter 1. <p><input type="checkbox"/> Internet</p> <p><input type="checkbox"/> PowerPoint slides</p> <p><input type="checkbox"/> Research articles</p>
	<p><u>PRACTICAL</u></p> <p>Module 1: Body Points of Animals</p> <ul style="list-style-type: none"> ○ Introduction to animal anatomy 	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 13.

	<ul style="list-style-type: none"> ○ Identifying key body points 	<input type="checkbox"/> Related research articles
Week 2	<p>Lecture 3: Livestock and Their Products</p> <p>Lecture 4: Domestication and Zoological Classification</p>	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 4. ○ Henderson, H.O. and S. Reaves (1962). Dairy Cattle Feeding and Management. Chapter 3. ○ Khan, B.B., M. Younas, M. Riaz, and M. Yaqoob (2005). Breeds of Livestock in Pakistan. Chapter 1. <input type="checkbox"/> Internet <input type="checkbox"/> PowerPoint slides <input type="checkbox"/> Research articles
	<p><u>PRACTICAL</u></p> <p>Module 2: Identification and Application of Various Management Tools</p> <ul style="list-style-type: none"> ○ Overview of tools used in livestock management ○ Practical applications of these tools 	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 7. ○ Khan, B.B., M. Yaqoob, M. Riaz, and M. Younas, and A. Iqbal (2004). Livestock Management Manual. Chapter 4. <input type="checkbox"/> Related research articles
Week 3	<p><u>THEORY</u></p> <p>Lecture 5: Brief Review of Principles of Livestock Management</p> <p>Lecture 6: Common Terminology</p>	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 6. ○ Khan, B.B., M. Yaqoob, M. Riaz,

		<p>and M. Younas, and A. Iqbal (2004). Livestock Management Manual. Chapter 2.</p> <ul style="list-style-type: none"> ○ Shah, S.I. (Ed.) (1994). Animal Husbandry. Glossary. <p><input type="checkbox"/> Internet</p> <p><input type="checkbox"/> PowerPoint slides</p> <p><input type="checkbox"/> Research articles</p>
	<p><u>PRACTICAL</u></p> <p>Module 3: Handling and Restraining of Animals</p> <ul style="list-style-type: none"> ○ Techniques for safe handling ○ Restraining methods 	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 7. ○ Khan, B.B., M. Yaqoob, M. Riaz, and M. Younas, and A. Iqbal (2004). Livestock Management Manual. Chapter 5. <p><input type="checkbox"/> Related research articles</p>
<p>Week 4</p>	<p><u>THEORY</u></p> <p>Lecture 7: Farm Records</p> <p>Lecture 8: Livestock Housing</p>	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 7. ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 8.
	<p><u>PRACTICAL</u></p> <p>Module 4: Grooming and Cleaning of Animals</p> <ul style="list-style-type: none"> ○ Importance of grooming ○ Methods and best practices 	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 7. ○ Khan, B.B., M.

		<p>Yaqoob, M. Riaz, and M. Younas, and A. Iqbal (2004). Livestock Management Manual. Chapter 5.</p> <p><input type="checkbox"/> Related research articles.</p>
Week 5	<p><u>THEORY</u></p> <p>Lecture 9: Gross Composition of Milk of Various Species</p> <p>Lecture 10: Milk Products</p>	<ul style="list-style-type: none"> ○ Henderson, H.O. and S. Reaves (1962). Dairy Cattle Feeding and Management. Chapter 4. ○ Henderson, H.O. and S. Reaves (1962). Dairy Cattle Feeding and Management. Chapter 5. <p><input type="checkbox"/> Internet</p> <p><input type="checkbox"/> PowerPoint slides</p> <p><input type="checkbox"/> Research articles</p>
	<p><u>PRACTICAL</u></p> <p>Module 5: Demonstration of Various Components of Livestock Farming</p> <ul style="list-style-type: none"> ○ Key components and their roles ○ Demonstrations and practical applications 	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 14. ○ Khan, B.B., M. Yaqoob, M. Riaz, and M. Younas, and A. Iqbal (2004). Livestock Management Manual. Chapter 6. <p><input type="checkbox"/> Related research articles</p>
Week 6	<p><u>THEORY</u></p> <p>Lecture 11: Transportation and Welfare of Farm Animals</p> <p>Lecture 12: Poultry Industry and Its Importance</p>	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 9. ○ Card, L.E. and M.C. Nesheim (1973). Poultry Production. Chapter 1.

		<ul style="list-style-type: none"> ○ Haq, A. and M. Akhtar (2004). Poultry Farming. Chapter 1. <input type="checkbox"/> Internet <input type="checkbox"/> PowerPoint slides <input type="checkbox"/> Research articles
	<p><u>PRACTICAL</u></p> <p>Module 6: Various Housing Plans Activities:</p> <ul style="list-style-type: none"> ○ Overview of housing plans ○ Factors influencing housing design 	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 8. ○ Khan, B.B., M. Yaqoob, M. Riaz, and M. Younas, and A. Iqbal (2004). Livestock Management Manual. Chapter 7. • <input type="checkbox"/> Related research articles
<p>Week 7</p>	<p><u>THEORY</u></p> <p>Lecture 13: Classes, Breeds, and Varieties of Poultry and Their Characteristics</p> <p>Lecture 14: Selection, Care, and Storage of Hatching Eggs</p>	<ul style="list-style-type: none"> ○ Card, L.E. and M.C. Nesheim (1973). Poultry Production. Chapter 2. ○ Donald, D.B. and W.D. Weaver (2007). Commercial Chicken, Meat and Egg Production. Chapter 2. ○ Card, L.E. and M.C. Nesheim (1973). Poultry Production. Chapter 3. ○ Haq, A. and M. Akhtar (2004). Poultry Farming. Chapter 2.

		<input type="checkbox"/> Internet <input type="checkbox"/> PowerPoint slides <input type="checkbox"/> Research articles
	<p><u>PRACTICAL</u> Module 7: Demonstration of Various Housing Plans</p>	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 8. ○ Khan, B.B., M. Yaqoob, M. Riaz, and M. Younas, and A. Iqbal (2004). Livestock Management Manual. Chapter 7. <input type="checkbox"/> Related research articles.
<p>Week 8</p>	<p><u>THEORY</u> Lecture 15: Types of Incubators and Incubation Requirements Lecture 16: Types of Brooders and Brooding Requirements</p>	<ul style="list-style-type: none"> ○ Card, L.E. and M.C. Nesheim (1973). Poultry Production. Chapter 4. ○ Haq, A. and M. Akhtar (2004). Poultry Farming. Chapter 3. ○ Card, L.E. and M.C. Nesheim (1973). Poultry Production. Chapter 5. ○ Haq, A. and M. Akhtar (2004). Poultry Farming. Chapter 4. <input type="checkbox"/> Internet <input type="checkbox"/> PowerPoint slides <input type="checkbox"/> Research articles
	<p><u>PRACTICAL</u> Module 8: Milk Quality Analysis</p> <ul style="list-style-type: none"> ○ Parameters of milk quality 	<ul style="list-style-type: none"> ○ Henderson, H.O. and S. Reaves (1962). Dairy Cattle Feeding and Management. Chapter 4.

	<ul style="list-style-type: none"> ○ Techniques for analysis 	<input type="checkbox"/> Related research articles
Week 9	MID TERM EXAMS	
Week 10	<p><u>THEORY</u></p> <p>Lecture 17: Broiler Management</p> <p>Lecture 18: Layer Management</p>	<ul style="list-style-type: none"> ○ Donald, D.B. and W.D. Weaver (2007). Commercial Chicken, Meat and Egg Production. Chapter 3. ○ Haq, A. and M. Akhtar (2004). Poultry Farming. Chapter 5. ○ Donald, D.B. and W.D. Weaver (2007). Commercial Chicken, Meat and Egg Production. Chapter 4. ○ Haq, A. and M. Akhtar (2004). Poultry Farming. Chapter 6. <input type="checkbox"/> Internet <input type="checkbox"/> PowerPoint slides <input type="checkbox"/> Research articles
	<p><u>PRACTICAL</u></p> <p>Module 9: Demonstration of Different Breeds of Livestock</p> <ul style="list-style-type: none"> ○ Characteristics of different breeds ○ Demonstrations and comparisons 	<ul style="list-style-type: none"> ○ Khan, B.B., M. Younas, M. Riaz, and M. Yaqoob (2005). Breeds of Livestock in Pakistan. Chapters 2-5. ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 14. <input type="checkbox"/> Related research articles
Week 11	<p><u>THEORY</u></p> <p>Lecture 19: Housing and Equipment for Poultry Birds</p> <p>Lecture 20: Introduction to Genetics</p>	<ul style="list-style-type: none"> ○ Card, L.E. and M.C. Nesheim (1973). Poultry Production. Chapter 6. ○ Haq, A. and M. Akhtar (2004).

		<p>Poultry Farming. Chapter 7.</p> <ul style="list-style-type: none"> ○ Tamarin, R. (1999). Principles of Genetics. Chapter 1. ○ Relevant chapters on serological methods <p><input type="checkbox"/> Internet</p> <p><input type="checkbox"/> PowerPoint slides</p> <p><input type="checkbox"/> Research articles</p>
	<p><u>PRACTICAL</u></p> <p>Module 10: Selection of Hatching Eggs</p> <ul style="list-style-type: none"> ○ Criteria for selecting hatching eggs ○ Handling and care 	<ul style="list-style-type: none"> ○ Card, L.E. and M.C. Nesheim (1973). Poultry Production. Chapter 3. ○ Haq, A. and M. Akhtar (2004). Poultry Farming. Chapter 2. <p><input type="checkbox"/> Related research articles</p>
<p>Week 12</p>	<p><u>THEORY</u></p> <p>Lecture 21: Basic Concepts and Role in Animal Breeding</p> <p>Lecture 22: Breeds of Livestock and Breeds of Milch Animals</p>	<ul style="list-style-type: none"> ○ Lasley, J.F. (1963). Genetics of Livestock Improvement. Chapter 1. ○ Tamarin, R. (1999). Principles of Genetics. Chapter 2. ○ Khan, B.B., M. Younas, M. Riaz, and M. Yaqoob (2005). Breeds of Livestock in Pakistan. Chapter 2. <p><input type="checkbox"/> Internet</p> <p><input type="checkbox"/> PowerPoint slides</p> <p><input type="checkbox"/> Research articles</p>
	<p><u>PRACTICAL</u></p>	<ul style="list-style-type: none"> ○ Card, L.E. and M.C. Nesheim (1973). Poultry Production.

	<p>Module 11: Handling of Incubator and Brooders</p> <ul style="list-style-type: none"> ○ Incubator setup and maintenance ○ Brooder management 	<p>Chapter 5.</p> <ul style="list-style-type: none"> ○ Haq, A. and M. Akhtar (2004). Poultry Farming. Chapter 4. <p><input type="checkbox"/> Related research articles</p>
<p>Week 13</p>	<p><u>THEORY</u></p> <p>Lecture 23: Draught and Dual-Purpose Cattle</p> <p>Lecture 24: Breeds of Buffalo</p>	<ul style="list-style-type: none"> ○ Khan, B.B., M. Younas, M. Riaz, and M. Yaqoob (2005). Breeds of Livestock in Pakistan. Chapter 3. ○ Khan, B.B., M. Younas, M. Riaz, and M. Yaqoob (2005). Breeds of Livestock in Pakistan. Chapter 4. <p><input type="checkbox"/> Internet</p> <p><input type="checkbox"/> PowerPoint slides</p> <p><input type="checkbox"/> Research articles</p>
	<p><u>PRACTICAL</u></p> <p>Module 12: Handling of Various Farm Equipment</p> <ul style="list-style-type: none"> ○ Overview of essential farm equipment ○ Handling and maintenance 	<ul style="list-style-type: none"> ○ Khan, B.B., M. Yaqoob, M. Riaz, and M. Younas, and A. Iqbal (2004). Livestock Management Manual. Chapter 4. <p><input type="checkbox"/> Related research articles</p>
<p>Week 14</p>	<p><u>THEORY</u></p> <p>Lecture 25: Breeds of Sheep and Goat</p> <p>Lecture 26: Breeding and Breeding Season</p>	<ul style="list-style-type: none"> ○ Khan, B.B., M. Younas, M. Riaz, and M. Yaqoob (2005). Breeds of Livestock in Pakistan. Chapter 5. ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 10.

		<input type="checkbox"/> Internet <input type="checkbox"/> PowerPoint slides <input type="checkbox"/> Research articles
	<p><u>PRACTICAL</u></p> <p>Module 13: Various Management Practices</p> <ul style="list-style-type: none"> ○ Best practices in livestock management 	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 6. ○ Khan, B.B., M. Yaqoob, M. Riaz, and M. Younas, and A. Iqbal (2004). Livestock Management Manual. Chapter 5. <input type="checkbox"/> Related research articles
Week 15	<p><u>THEORY</u></p> <p>Lecture 27: Reproductive Cycle, Age at Puberty, and Gestation</p> <p>Lecture 28: Fertility, Sterility, and Artificial Breeding</p>	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 11. ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 12. <input type="checkbox"/> Internet <input type="checkbox"/> PowerPoint slides <input type="checkbox"/> Research articles
	<p><u>PRACTICAL</u></p> <p>Module 14: Male and Female Reproductive Organs</p> <ul style="list-style-type: none"> ○ Anatomy and functions ○ Reproductive health 	<ul style="list-style-type: none"> ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 11. <input type="checkbox"/> Related research articles
Week 16	<p><u>THEORY</u></p> <p>Lecture 29: System of Breeding and Principles of</p>	<ul style="list-style-type: none"> ○ Lasley, J.F. (1963). Genetics of Livestock Improvement.

	<p>Selection</p> <p>Lecture 30: Biotechnological Techniques in Animal Breeding and Genetics</p>	<p>Chapter 2.</p> <ul style="list-style-type: none"> ○ Tamarin, R. (1999). Principles of Genetics. Chapter 3. ○ Lasley, J.F. (1963). Genetics of Livestock Improvement. Chapter 3. <p><input type="checkbox"/> Internet</p> <p><input type="checkbox"/> PowerPoint slides</p> <p><input type="checkbox"/> Research articles</p>
	<p><u>PRACTICAL</u></p> <p>Module 15: Exercises on Topics Related to Breeding and Selection</p> <ul style="list-style-type: none"> ○ Breeding strategies and selection 	<ul style="list-style-type: none"> ○ Lasley, J.F. (1963). Genetics of Livestock Improvement. Chapter 2. ○ Benerjee, G.C. (1998). A Textbook of Animal Husbandry. Chapter 12. <p><input type="checkbox"/> Related research articles</p>
<p>Week 17</p>	<p><u>THEORY</u></p> <p>Lecture 31: Basic Terms in Animal Nutrition</p> <p>Lecture 32: Common Feeds and Their Classification, Feeding Standards, and their Evaluation</p>	<ul style="list-style-type: none"> ○ McDonald, P., R.A. Edwards, J.F.D. Greenhalgh, and C.A. Morgan (2008). Animal Nutrition. Chapter 1. ○ McDonald, P., R.A. Edwards, J.F.D. Greenhalgh, and C.A. Morgan (2008). Animal Nutrition. Chapter 2. <p><input type="checkbox"/> Internet</p> <p><input type="checkbox"/> PowerPoint slides</p>

		<input type="checkbox"/> Research articles
	<p><u>Practical</u></p> <p>Module 16: Identification of Feed Samples and Formulation of Balanced Rations</p> <ul style="list-style-type: none"> ○ Identifying different feed samples ○ Principles of ration formulation 	<ul style="list-style-type: none"> ○ McDonald, P., R.A. Edwards, J.F.D. Greenhalgh, and C.A. Morgan (2008). Animal Nutrition. Chapter 3. • Protocols and practical guidance for conducting assessments <input type="checkbox"/> Related Research articles
Week 18	FINAL TERM EXAM	
Textbooks and Reading Material		
<p>a. <u>Recommended books</u></p> <p style="padding-left: 40px;">i. Textbooks.</p> <ol style="list-style-type: none"> 1. Benerjee, G.C., 1998. A Textbook of Animal Husbandry. Oxford and IBH Publ, Co., New Delhi, India. 2. Card, L., E. and M.C. Neshim, 1973. Poultry Production (11th Ed.) Bailliere Tindall, London, UK. 3. Donald, D. B. and W. D. Weaver, 2007. Commercial Chicken, Meat and Egg Production, Springer Pvt. Ltd., India. 4. Haq, A. and M. Akhtar, 2004, Poultry Farming. Higher Education Commission, H-9, Islamabad, Pakistan. 5. Henderson, H.O. and S. Reaves, 1962. Dairy Cattle Feeding and Management. John Wiley and Sons, Inc., New York, USA. 6. Khan, B.B., M. Yaqoob, M. Riaz and M. Younas, and A. Iqbal, 2004. Livestock Management Manual. Dep. Of Livestock Management, University of Agriculture Faisalabad. 7. Khan, B.B., M. Younas, M. Riaz and M. Yaqoob, 2005. Breeds of Livestock in Pakistan. Pak T.M. printers, Aminpur Bazar, Faisal Abad, Pakistan. 8. Tamarin, R., 1999. Principles of Genetics (6th Ed.) McGraw Hill Co., Boston, USA. 9. Shah, S.I. (Ed.) 1994., Animal Husbandry. National Book Foundation, Islamabad. 10. McDonald, P., R.A. Edwards, J.F.D. Greenhalf and C.A. Morgan, 2008. Animal Nutrition. (6th Ed.) Longman Scientific and Technical publishers, UK. 11. Lasley, J.F., 1963. Genetics of Livestock Improvement. Prentice Hall Inc. Englewood Cliffs, N.F. USA. <p>In the detail course outline, one may mention chapters of the textbook with the content topics.</p> <p style="text-align: center;">b. <u>Journal Articles/ Reports available in library and on internet</u></p>		

Note:

- It is preferable to use latest available editions of books. Mention the publisher & year of publication.
- The References/ bibliography may be in accordance with the typing manual of the concerned faculty/subject. Preferably follow APA 7th Edition publication manual.

Teaching Learning Strategies

Teaching-learning strategies for the course aim to provide students with a comprehensive understanding of the principles and practices involved in the care and management of livestock:

1. **Lectures and Readings:**
 - **Purpose:** Introduce key concepts, theories, and practices.
 - **Approach:** Use multimedia presentations, textbooks, and scholarly articles to deliver content.
2. **Practical Demonstrations:**
 - **Purpose:** Provide hands-on experience with animal handling and care.
 - **Approach:** Organize farm visits, laboratory sessions, and live demonstrations on animal management practices.
3. **Interactive Discussions and Q&A Sessions:**
 - **Purpose:** Foster critical thinking and deeper understanding.
 - **Approach:** Encourage student participation through discussions, debates, and question-and-answer sessions.
4. **Case Studies and Problem-Solving Exercises:**
 - **Purpose:** Apply theoretical knowledge to real-world scenarios.
 - **Approach:** Present case studies on animal health issues, farm management challenges, and ethical dilemmas in animal husbandry.
5. **Group Projects and Collaborative Learning:**
 - **Purpose:** Promote teamwork and collective problem-solving.
 - **Approach:** Assign group projects on topics like farm design, sustainable practices, and breeding programs.
6. **Guest Lectures and Expert Panels:**
 - **Purpose:** Provide industry insights and professional perspectives.
 - **Approach:** Invite experts from the field to share their experiences and knowledge.
7. **Field Trips and Farm Visits:**
 - **Purpose:** Expose students to real-world farming environments.
 - **Approach:** Organize visits to different types of farms (dairy, poultry, swine, etc.) to observe operations and management practices.
8. **Online Resources and E-learning:**
 - **Purpose:** Supplement in-class learning with digital content.
 - **Approach:** Utilize online courses, videos, and interactive modules for additional learning support.
9. **Assessment and Feedback:**
 - **Purpose:** Evaluate understanding and provide constructive feedback.

- **Approach:** Use quizzes, exams, practical assessments, and reflective journals to assess student progress.

10. Simulation and Role-Playing:

- **Purpose:** Simulate real-life scenarios and decision-making processes.
- **Approach:** Use software simulations and role-playing exercises to mimic farm management situations and problem-solving.

By incorporating these diverse strategies, the course can effectively cover both theoretical and practical aspects of animal husbandry, ensuring a well-rounded education for students.

Assignments: Types and Number with Calendar

Mentioned in course content

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.