

SCHEME OF STUDIES

B.SC. (HONS.) POULTRY SCIENCE

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FOR

B.Sc. (HONS.) POULTRY SCIENCE (4 years)

Program objectives

The B.Sc(Hons.) Poultry Science 4 years (8 semesters) degree aims equipping the students with knowledge and skills required to analyze and finding the solutions of challenges faced by poultry sector in present scenario, consistence with the interest of all stakeholders.

Eligibility Criteria

1. FSc Pre-Medical with 50% Marks.
2. Candidates having F.Sc Pre-Engineering with 50 % marks will be eligibile subject to study deficiency course in Biology BIO-301, 3(2-1) (Essentials of Biology)
3. Candidates having F.Sc Pre-Agriculture with 50 % marks will be eligible subject to study deficiency course in Biology BIO-301, 3(2-1) (Essentials of Biology)

No. of Seats - 100

A total number of 100 seats will be available for admission and equal opportunity will be provided to female candidates.

Total Credit hours: 138

Major courses

Course No.	Title of the Course	Credit Hours
PS-301	Introduction to Poultry Science	3(2-1)
PS-302	Poultry Breeding Practices	3(2-1)
PS-303	Poultry Physiology	3(2-1)
AN-301	Fundamentals of Animal Nutrition	3(2-1)
ABG-301	Principles of Heredity	3(2-1)
PS-304	Rural Poultry Production	3(2-1)
AN-302	Metabolism of Primary Nutrients	3(2-1)
ABG-302	Introductory Molecular Genetics	3(2-1)
PS-401	Incubation Principles and Hatchery Management	3(2-1)
PS-403	Poultry Housing and Equipment	3(2-1)
ABG-401	Introductory Population Genetics	3(2-1)
AN-303	Mineral and Vitamin Metabolism	3(2-1)
PS-402	Poultry Farm Management	3(2-1)
PS-404	Poultry Feeding Practices	3(2-1)
PS-406	Broiler Production and Management	3(2-1)
PS-408	Poultry Meat Inspection	2(1-1)

AN-404	Feed Evaluation, Formulation and Processing Technology	3(2-1)
PS-501	Poultry Farm Management & Biosecurity	3(2-1)
PS-503	Layer Production and Management	3(2-1)
PS-505	Poultry Farm Practices-I	2(0-2)
ABG-501	Applied Poultry Breeding	3(2-1)
PS-502	Fancy bird production	3(2-1)
PS-504	Production and Management of Breeder Flock	2(1-1)
PS-506	Poultry Farm Practices-II	2(0-2)
AN-502	Principles of Poultry Nutrition	4(3-1)
PS-601	Poultry Products Technology	3(2-1)
PS-603	Poultry Marketing and Economics	3(2-1)
PS-605	Farm Records and Data Analysis	3(2-1)
AN-601	Poultry Feed Industry	4(3-1)
PS-609	Preparation of Research Project and Scientific Writing	2(1-1)

Minor courses

Course NO.	Title of Course	Credit Hours
CS-301	Computer Science and Information Technology	2(0-2)
IS-401	Islamic Studies OR	3(3-0)
SSH-402	Ethics (for Foreign/Non-Muslim Students)	
Biochem-301	Elementary Biochemistry	4(3-1)
ENG-301	Composition and Communication Skills	3(3-0)
SSH-302	Pakistan Studies	2(2-0)
Zool-302	Biodiversity	2(1-1)
Micro-301	General Microbiology and Immunology	4(3-1)
STAT-302	Introductory Statistics	2(2-0)
AEE-402	Communication Skills and Leadership Development	2(1-1)
FMP-507	Farm Equipment, Structure & Processing	4(3-1)
Med-501	Poultry Medicine	3(2-1)
MAB-601	Agri-Business Management, Marketing and WTO	4(4-0)
Micro-505	Veterinary Epidemiology and Public Health	4(2-2)
Path-505	Poultry Pathology	3(2-1)
SRT-301	Social and Religious Tolerance	Audit
UAM-302	Citizenship Education and Community Engagement	Audit

Semester wise Description

1st Semester

Course NO.	Title of Course	Credit Hours
PS-301	Introduction to Poultry Science	3(2-1)
PS-303	Poultry Physiology	3(2-1)
AN-301	Fundamentals of Animal Nutrition	3(2-1)
ABG-301	Principles of Heredity	3(2-1)
CS-301	Computer Science and Information Technology	2(0-2)
Biochem-301	Elementary Biochemistry	4(3-1)
Total		18

2nd Semester

Course NO.	Title of Course	Credit Hours
PS-302	Poultry Breeding Practices	3(2-1)
PS-304	Rural Poultry Production	3(2-1)
AN-302	Metabolism of Primary Nutrients	3(2-1)
ABG-302	Introductory Molecular Genetics	3(2-1)
ENG-301	Composition and Communication Skills	3(3-0)
SSH-302	Pakistan Studies	2(2-0)
Zool-302	Biodiversity	2(1-1)
SRT-301	Social and Religious Tolerance	Audit
Total		19

3rd Semester

Course NO.	Title of Course	Credit Hours
PS-401	Incubation Principles and Hatchery Management	3(2-1)
PS-403	Poultry Housing and Equipment	3(2-1)
ABG-401	Introductory Population Genetics	3(2-1)
AN-303	Mineral and Vitamin Metabolism	3(2-1)
Micro-301	General Microbiology and Immunology	4(3-1)
STAT-302	Introductory Statistics	2(2-0)
UAM-302	Citizenship Education and Community Engagement	Audit
Total		18

4th Semester

Course NO.	Title of Course	Credit Hours
PS-402	Poultry Farm Management	3(2-1)
PS-404	Poultry Feeding Practices	3(2-1)
PS-406	Broiler Production and Management	3(2-1)
PS-408	Poultry Meat Inspection	2(1-1)
AN-404	Feed Evaluation, Formulation and Processing Technology	3(2-1)
AEE-402	Communication Skills and Leadership Development	2(1-1)
IS-401	Islamic Studies OR	3(3-0)
SSH-402	Ethics (for Foreign/Non-Muslim Students)	
Total		19

5th Semester

Course NO.	Title of Course	Credit Hours
PS-501	Poultry Farm Management & Biosecurity	3(2-1)
PS-503	Layer Production and Management	3(2-1)
PS-505	Poultry Farm Practices-I	2(0-2)
ABG-501	Applied Poultry Breeding	3(2-1)
FMP-507	Farm Equipment, Structure & Processing	4(3-1)
Path-505	Poultry Pathology	3(2-1)
Total		18

6th Semester

Course NO.	Title of Course	Credit Hours
PS-502	Fancy bird production	3(2-1)
PS-504	Production and Management of Breeder Flock	2(1-1)
PS-506	Poultry Farm Practices-II	2(0-2)
AN-502	Principles of Poultry Nutrition	4(3-1)
MAB-601	Agri-Business Management, Marketing and WTO	4(4-0)
Micro-505	Veterinary Epidemiology and Public Health	4(2-2)
Total		19

7th Semester

Course NO.	Title of Course	Credit Hours
PS-601	Poultry Products Technology	3(2-1)
PS-603	Poultry Marketing and Economics	3(2-1)
PS-605	Farm Records and Data Analysis	3(2-1)
AN-601	Poultry Feed Industry	4(3-1)
PS-609	Preparation of Research Project and Scientific Writing	2(1-1)
Med-501	Poultry Medicine	3(2-1)
Total		18

8th Semester

Course NO.	Title of Course	Credit Hours
PS-610	Internship	6(0-12)

Course Scheme

PS-301

Introduction to Poultry Science

3(2-1)

Learning Objectives

After the completing the course, students will be able to:

- Knowledge about importance of poultry in Pakistan.
- Learn different purpose of poultry production.
- Knowledge of prospects of poultry production.

Theory:

Importance of poultry farming; basic needs of poultry farming, development of world poultry industry; growth of poultry industry in Pakistan; present status and future potentials; problems of poultry industry in Pakistan, poultry industry vs livestock/agricultural enterprises; glossary in poultry science; taxonomic classification of poultry; prospects of poultry production other than chicken and their significance; introduction and planning of various poultry enterprises; poultry farm organization; significance of poultry meat and eggs.

Practicals:

Demonstration of routine activities of various components at poultry farm; practices related to brooding, rearing of layer, broiler, and breeder production, hatchery practices; identification of different species of poultry; illustration of body parts of fowl.

Suggested Reading:

1. Bell, D.D. and W.D. Weaver. 2007. Commercial Chicken Meat and Egg Production. 5th Ed. Springer Private, Limited, India.
2. Brown, T. 2010. Poultry Farming. Apple Academic Press 3333 Mistwell Crescent Oakville, ON 6L6 0A2.
3. Prasad, R. 2010. Poultry Management. Alpha Publications, New Delhi, India.
4. Sreenivasaih, P.V. 2006. Scientific Poultry Production. 3rd Ed. International Book Distributing Co., Lucknow, India.

PS-302

Poultry Breeding Practices

3(2-1)

Learning Objectives

After the completing the course, students will be able to:

- Have to knowledge of pure breed.
- To obtain the advanced commercial strain of broiler and layer.
- Selection and culling techniques

Theory:

Origin, domestication and historical development of fowl; poultry breeds and their characteristics; maintenance of pure lines; commercial strains of broiler and layer; rural poultry, judging and selection of poultry for eggs, meat and show purposes: mating systems and their significance; pigmentation; body conformation and other qualities; culling procedure and its significance in maintaining growth and production performance.

Practicals:

Description and demonstration of different poultry breeds; judging; selection and culling techniques; preparation of birds for exhibition; visits to commercial flocks and poultry shows.

Suggested Readings

1. Crawford, R.D. 1990. Poultry Breeding and Genetics. Elsevier Science Publishers, Amsterdam, The Netherlands.
2. Dagher, N.J. 2008. Poultry Production in Hot Climates. 2nd Ed. CABI Publications. Wallingford Oxon OX10 8DE, UK.
3. Leeson, S. and J.D. Summers. 2000. Broiler Breeder Production. International Book Distributing Co. Lucknow, India.
4. Muir, W.M. and S.E. Aggery. 2003. Poultry Genetics, Breeding and Biotechnology. CABI Publications. Wallingford Oxon OX10 8DE, UK.

AN-301

Fundamentals of Animal Nutrition

3(2-1)

Learning Objectives

After the completing the course, students will be able to:

- Know about digestive philosophy of livestock and poultry.
- Give nutrition in relation to body requirements
- Nutritional importance in management of livestock and poultry.

Theory:

History, scope and development of science of nutrition, Commonly used terminology, Feed resources and their classification, Digestive physiology of livestock and poultry, Regulation of feed intake, Importance of primary and secondary nutrients, their classification and functions. Absorption of nutrients in different species of livestock and poultry, Nutrition in relation to body requirements for maintenance, growth and production.

Practicals:

Identification of feed ingredients/ feed raw materials, their physical examination and characteristics. Procurement of sample, their preparation for analysis and introduction to proximate analysis of feed.

Suggested Readings

1. Cheeke, P.R. 2005. Applied Animal Nutrition, Feeds and Feeding. 3rd Ed. Pearson Prentice Hall Inc. New Jersey, USA.
2. Kellems, R.O. and D.C. Church. 2009. Livestock Feeds and Feeding. Prentice Hall Inc. New Jersey, USA.
3. Pond, W.G., D.C. Church, K.R. Pond and P.A. Schoknecht. 2005. Basic Animal Nutrition and Feeding. (5th Ed.), John Wiley and Sons, New York, USA.

ABG-301**Principles of Heredity****3(2-1)****Learning Objectives**

After the completing the course, students will be able to:

- Basic terminology and knowledge about genetics.
- Microscopic studies on the cells
- Application of different modules in genetics.

Theory:

Genetics: historical development. Genetic basis of inheritance: Heredity and variations. The cell cycle. Gametogenesis: spermatogenesis, oogenesis. Mendelism: basic terminology, Mendel's laws, Monohybrid, dihybrid and polyhybrid crosses. Applications of Mendel's principle. Concept and laws of probability. Chi-square test and its applications. Modified segregation ratios, Epistasis and its different types. Multiple allelomorphism, Genetics of sex: sex determining mechanisms, sex linkage and its variation, Polygenic inheritance, Pleiotropy. Linkage, crossing over and chromosomal mapping. Extra nuclear inheritance.

Practicals:

Microscopic studies on the animal and plant cells undergoing mitosis and meiosis. Numerical problems on topics discussed in theory.

Suggested Readings

1. Elord, S. and W.E. Stansfield. 2009. Schaum's Outline of Theory and Problems of Genetics. Tata McGraw-Hill Book Co., New Delhi, India.
2. Klug, W.S., M.R. Cummings, C. Spencer and A.M. Palladino. 2008. Concepts of Genetics. The Benjamin Publishing Co., Inc., Menlo Park, CA, USA.
3. Lewis, R. 2005. Human Genetics. McGraw-Hill Co. Inc., New York, USA.
4. Pierce, B.A. 2012. Genetics—a conceptual approach. 4th Ed. <http://bcs.whfreeman.com/pierce3e/default.asp>

CS-301 Computer Appreciation and Application**3(2-1)****Learning Objectives**

After the completing the course, students will be able to:

- Basic knowledge about computer and its parts.
- Types of network and terminology related to computer.
- Use computer in professional life.

Theory:

Overview of computer system: Brief history of computers, uses and misuses, importance, future needs; types of Computer: super, mainframe, minim, micro, desktop, notebook, personnel and workstation. Parts of Computer, CPU, control unit, arithmetic unit, memory, ROM and its types, RAM and its types, Flash memory and cash memory, Buses: data bus, address bus, control bus. Motherboard (circuit boards) Micro-processor and its types. Interacting with Computer. Input device Key board, mouse, Track ball, touch screen, touch pads, barcode readers etc, output device: Monitors, types of monitors, printers: types of printers, plotters, storage devices: magnetic storage and optical storage hard disc, tape device, CD etc. Software: Types of software, system software, shareware, application software. Operating System. Network: uses & types of network LAN, WAN, Data Communication over Telephone lines: modem, ISDN, DSL & high speed lines, internet: Working of internet, feature of internet: email ,newsgroups, telnet, FTP, WWW, HTTP, online services, Addressing schemes: DNS, IP.S

Practicals:

Window operating system, uses of MS Word procession, MS Excel (spreadsheets), Power point exercises and essential use of Internet, E-mail and Surfing.

Suggested Readings

1. David, R. 2010. A Balanced Introduction to Computer Science. Pearson Education, Canada.
2. Norton, P. 2004. Introduction to Computer. McGraw-Hill Technology Education, USA.
3. Saeed. I, A. Raza and T. Mahmood. 2011. The Concept of Information Technology, IT Series Publishers, Lahore, Pakistan.
4. Shelly, G.B and G.A. Wagoner. 2011. Using Computers: A gateway to Information. Boyd and Fraser Publishers, USA.

SSH-402**Ethics****3(3-0)****Learning Objectives**

After studying this course the students would be able to

- Knowledge about ethics
- Ethical teachings of different Religions

Theory:

Definition, scope and nature of ethics, logic and ethics, concept of good and evil, freedom and responsibilities, ethical teaching of Islam, Christianity, Buddhism and Hinduism, rights of minorities in Islam, general review of business ethics, profit and ethics, business ethics, ethics of stake holders, general review of biomedical ethics, ethics and ecology, rights to livable environment and animals.

Suggested Readings

1. Little, W. 2009. An Introduction to Ethics, Mathuen& Co. Ltd, London.
2. Jonathan, C. 2011. Humanity: A Moral History of the 21st

Biochem-301 Elementary Biochemistry

4(3-1)

Learning Objectives

After the completing the course, students will be able to:

- Identify the cell and its organelles.
- Basic information about basic ingredients of diet.
- Structure and functions of macro-molecules.

Theory:

Cell structure and function: Structure, composition and functions of cell organelles. Biomembranes and their functions, cyroskeleton, pH, buffers, transport mechanisms across biological membranes, diffusion, osmosis and osmotic presucellenviroment; temperature, pH, buffers, transport mechanisms across bio-membranes, diffusion, osmosis and osmotic pressure. Enzymes: Classification, nomenclature, characteristics, coenzymes, cofactors and prosthetic groups. Mechanism of enzyme action. Enzyme inhibition. Carbohydrates: Classification, characteristics, ring structures and isomerism. Aerobic and anaerobic oxidation of glucose. Biological functions of carbohydrates. Lipids: Composition and classification, structures of saturated and unsaturated fatty acids and their properties, characteristics of fats and oils. General metabolism of fats, beta oxidation of fatty acids. Proteins: Composition and classification, characteristics and classification of amino acids, molecules derived from amino acids, peptides and levels of structural organization of proteins. Physiological functions and general metabolism of proteins. Nucleic acids: Chemical composition and structures of DNA and RNA. Functions of DNA and different types of RNA in the cell. Extra-nuclear DNA and plasmids. Central Dogma and its significance. Introduction to replication, transcription and translation processes.

Practicals:

Preparation of buffers of definite pH.Determination of pH value of biological fluids. Estimation of optical activity by polarimetry. Qualitative analysis of carbohydrates. Qualitative analysis of urine for albumin, acetone bodies and sugar. Estimation of glucose in biological fluids. Determination of acid, saponification and iodine values of fats/oils. Estimation of lactose and casein in milk.

Suggested Readings

1. Ahmad, M. 2009. Essentials of Medical Biochemistry. Vol. I, 8th Ed. Ilmi Book House, Urdu Bazar, Lahore.
2. Champe, P.C., R.A. Harvey and D.R. Ferrier. 2008. Biochemistry: Lippincott's Illustrated Reviews. 4th Ed. Lipponcott Williams and Wilkins, USA.
3. Murray, R.K., D.A. Benderer, K.M. Bothem, P.J. Kennelly, V.W. Rodwell and P.A. Weil. 2009. Harper's Illustrate Biochemistry. 28th Ed. McGraw Hill, New York, USA.
4. Nelson, D.L and M.M. Cox. 2008. Lehninger Principals of Biochemistry. 4th Ed. Worth Publishers, New York, USA.
5. Plummer, D.T. 2009. An Introduction to Practicals: Biochemistry. 3rd Ed. Tata McGraw-Hill Education (Pvt) Ltd, New Delhi, USA.

PS-303

Poultry Physiology

3(2-1)

Learning Objectives

After the completing the course, students will be able to:

- Identify the basic systems of poultry.
- Have knowledge about the functions of systems.
- Able to record the basic health parameters.

Theory:

Physiology of digestive system; absorption from alimentary tract, respiratory system; respiration and temperature regulation; circulatory system; physiology of muscular system; nervous system; excretory system; endocrine system; hormone types and functions; male and female reproductive system; Light stimulation and laying cycle; body temperature control, stress management in poultry birds.

Practicals:

Dissection of fowl; identification of digestive, respiratory, urinary, cardiovascular and reproductive systems, demonstration of different glands and immune organs; collection of blood and use of anticoagulants; measurement of pulse, respiratory rate and body temperature.

Suggested Readings

1. Appleby, M.C., J.A. Mench and B.O. Hughes. 2004. Poultry Behaviour and Welfare. CABI Publishing, Nosworthy Way, Willingford, Oxfordshire, OX 10 8DE, UK.
2. Dagher, N.J. 2008. Poultry Production in Hot Climates. 2nd Ed. CABI Publications. Wallingford Oxon OX 10 8DE, UK.
3. Rehman, Z, A.K. Junaid and T. Khaliq. 2005. Manual of Physiology-I. Department of Physiology and Pharmacology, University of Agriculture, Faisalabad, Pakistan.

Learning Objectives

After the completing the course, students will be able to:

- Significance and scope of rural poultry farming.
- Standard operations involve in poultry farming at rural level.
- Manage the poultry at rural level.

Theory:

Status of rural poultry production in Pakistan; significance and scope of rural poultry farming; desi vs commercial poultry products; consumer attitudes; choosing right rural breed / strain for meat and egg production; housing and equipment; natural incubation; incubation requirements for small incubators; characteristics of broody hen; selection of hatching eggs; nest preparation; management during incubation; management during brooding, growing and laying; selection of feed ingredients; feed supplements/concentrates; feed formulation for rural poultry farming; feeding and watering practices; vaccination, medication and parasitic control; impact of season on performance of rural poultry; measures to improve rural poultry production.

Practicals:

Demonstration of suitable breeds for rural poultry production; types of houses and equipment;; nest preparation for natural incubation; collection, selection, cleaning, grading and storage of hatching eggs; selection of a good broody hen, care of hen and eggs during incubation process; feeding and watering practices; management during brooding, rearing and production; selection and culling techniques; differentiation between laying and a non-laying hen; vaccination and medication; preparation and handling of small incubators; feasibility report for rural poultry birds; visit to government poultry farms.

Suggested Readings

1. Bell, D.D. and W.D. Weaver. 2002. Commercial Chicken Meat and Egg Production. 5th Ed. Kluwer Academic Publishers, Norwell Massachusetts, USA.
2. Brown, T. 2010. Poultry Farming. Apple Academic Press, 3333 Mistwell Crescent, Oakville, ON L6L 0A2.
3. Sonaiya, E.B. and S.E.J. Swan. 2008. Small Scale Poultry Production. Discovery Publishing House, New Delhi, India.
4. Sreenivasaih, P.V. 2006. Scientific Poultry Production. 3rd Ed. International Book Distributing Co. Lucknow, India.

Learning Objectives

After the completing the course, students will be able to:

- Have knowledge about the classification and factors effecting carbohydrate metabolism.
- Have knowledge about the basic metabolic processes.
- Analysis of feed ingredients.

Carbohydrates: classification, Factor influencing rate of absorption of carbohydrates, glycolysis and its importance, lactic acid, Citric acid cycle, pentose phosphate pathway, gluconeogenesis, glycogenesis and glycogenolysis and their significance, Intermediary metabolism and hormonal regulation. Lipids: classification, β oxidation of fatty acids, fate of glycerol with respect to fat synthesis, glucose/ glycogen synthesis and its oxidation, Storage of fat. Protein: classification of amino acids and protein quality, fate of absorbed amino acids, Interconversion of dietary metabolites

Practicals:

Preparation and standardization of solutions, Proximate analysis of feeds/feed ingredients.

Suggested Readings

1. McDonald, P., R.A., Edwards Ad, J.F.D. Greenhalgh and C.A. Morgan. 2002. Animal Nutrition. Longman Scientific and Technical England, UK.
2. Murray, R.K., D.A. Bender, K.M. Botham, P.J. Kennelly, V.W. Rodwell and P.A. Weil. 2009. Harper's Illustrated Biochemistry. (28th Ed.). The McGraw-Hills Co, Inc., China.
3. Nelson, D.L., A.L. Lehninger and M.M. Cox. 2008. Principles of Biochemistry. W. H. Freeman and Co, New York, USA.
4. Pond, W.G, D.C. Church, K.R. Pond and P.A. Schoknecht. 2005. Basic Animal Nutrition and Feeding. (5th Ed.), John Wiley and Sons, New York, USA.

Learning Objectives

After the completing the course, students will be able to:

- Information about description of DNA/RNA.
- Know about genetic engineering and its applications.
- Know about various cytogenetic techniques.

Theory:

Biochemical basis of heredity: the nature of genetic material, nucleic acids, structure of DNA and RNA, DNA replication, transcription, and translation. Developmental aspects of genetic control: gene expression and cell differentiation, control of gene expression in eukaryotes. Genetic basis of immune response: components of immune system. Mutations: gene mutations and their types. Genetic engineering: basic concepts of recombinant DNA technology, gene cloning and manipulation, application and future.

Practicals:

Demonstration of various cytogenetic techniques; DNA extraction, Polymerase Chain Reaction, Gel Electrophoresis, Western Blotting, Plasmid Construction and Sequencing.

Suggested Readings

1. Hartl, L. 2006. Essential Genetics: A Genomics Perspective. 4th Ed. Jones and Bartlett Publishers, Inc. Sudbury, MA, USA.
2. Hartl, L. 2009. Genetics: Analysis of Genes and Genomes. 7th Ed. Jones and Bartlett Publishers, Inc. Sudbury, MA, USA.
3. Hodge, R. 2009. Genetic Engineering: Manipulating the Mechanisms of Life. Infobase Publishing, New York, USA.
4. Klug, W.S., M.R. Cummings, C. Spencer and A.M. Palladino. 2008. Concepts of Genetics. The Benjamin Publishing Co., Inc., Menlo Park, CA, USA.

ENG-301 Composition and Communication Skills**3(3-0)****Learning Objectives**

After studying this course the students would be able to

- Have the skills of reading, writing, presentation and communication.
- Write the report, analysis of speech.
- Effective communication.

Theory:

A selection of English (Textbook); The Marvel of Insects (Allan Devoe), Right and Wrong (C.S.Lewis), End of the Road (Muhammad Asad), Essay Writing, Technical Report Writing, Official Letters, Comprehension and précis writing (Current English passage) Grammatical Tools; (verbs, Adverbs; Gerund; Infinitive; participle; Moral Auxiliaries), Correction Skills and Seven c's of Effective Communication, Home Assignment (Presentation).

Suggested Readings

1. Advance Publishers, 2010. Advance Essays for All, Advance Publishers, Muslim Center, Urdu Bazar, Lahore.
2. Ahmad, A. 2009 To the Point (English Grammar and Composition for degree). To the Point Publishers, 5-A Yousaf Market, Ghanzi Street, Urdu Bazaar, Lahore.
3. Atta-ur-Rehman, S. 2010. Effective Business Communication and Report Writing, Farrukh and Brothers, PO Box 9025, Lahore.
4. Khan, N. and G.S Qureshi. 2011. A Selection of English Prose. The Carvan Book House, Katchery Road, Lahore.

SSH-302 Pakistan Studies**2(2-0)****Learning Objectives**

After studying this course the students would be able to

- Know two nation theory and its necessity.
- Different clarities involved in revelation of Pakistan.
- Knowledge about the brief history of Pakistan.

Theory:

Evolution of two nation concept in the sub-continent; role of two nation theory in the creation of Pakistan; ideology of Pakistan, founding fathers of Pakistan; Mujadid Alf Sani; Shah Waliullah; Sir Syed Ahmed Khan; Allama Iqbal; Quaid-e-Azam, Constitutional development in Pakistan, objective resolution; basic principle committee reports; Bogra formula; salient features of 1956 constitution; foreign policy of Pakistan; determinants of Pakistan's foreign policy; different phases of Pakistan's foreign policy; Pakistan's relations with super powers, United Nations Organization; main organs; special agencies; Pakistan role in the UNO.

Suggested Readings

1. Allana, G. 2010. Our Freedom Fighters. Ferozsons Ltd., Lahore.
2. Amin, S. 2010, Pakistan's Foreign Policy, Oxford University Press, Karachi.
3. Hussain, A. 2010. Encyclopedia of Pakistan. Jahangir Book Depot, Lahore.
4. Khan, H. 2010. Constitutional and Political History of Pakistan. Oxford University Press, Karachi.

Zool-302

Biodiversity

2(1-1)

Learning Objectives

After studying this course the students would be able to

- Basic terminology and knowledge of Biodiversity.
- Various approaches to conserve biological diversity.
- Techniques for estimation of population of wild

Theory:

Biodiversity and its importance. Biodiversity vs Agriculture - A paradox in the mind of people. Levels of biodiversity: Genetic, species and ecosystem level. Factors contributing towards loss of biodiversity. Assessing the value of biodiversity. Various approaches to conserve biological diversity.

Practicals:

Study of morphological characters and identification of animals including culture able fish species of Pakistan. Techniques for estimation of population of invertebrates, wild birds and small mammals. Visit to a local wetland to observe migratory and resident birds and report writing.

Suggested Readings

1. Hart, P.J.B. and J.D. Reynolds. 2008. Handbook of Fish Biology and Fisheries. Volume 2. Blackwell Science Ltd., USA.
2. Hosetti, B.B. 2005. Concepts in Wildlife Management. Daya Publishing House, New Delhi, India.
3. Sharma, O.P. 2009. Handbook of Fisheries and Aquaculture. Agrotech Publishing Academy, Udaipur, India.
4. Sinclair, A.R.E., J.M. Fryxell and G. Caughley. 2006. Wildlife Ecology, Conservation and Management. 2nd Ed. Blackwell Publishing, USA.

Learning Objectives

After studying this course the students would be able to

- Basic terminology and knowledge of Biodiversity.
- Various approaches to conserve biological diversity.
- Manage the hatchery.

Theory:

History, development and scope of hatchery industry in Pakistan; collection, handling and transport of hatching eggs; maintenance of quality in hatching eggs; selection, care and storage of hatching eggs; seasonal hatching; incubation methods; types of incubator; role of computer in modern hatchery operations; incubation requirements; setting and candling of eggs; daily changes in embryonic development during incubation: extra embryonic membranes and their functions; classification of embryo positions; physical act of hatching; critical periods of embryo development; embryonic metabolism; factors influencing fertility, hatchability and quality of chicks; taking off the hatch; sexing, vaccination; grading, packing and transportation of baby chicks; hatchery sanitation and waste disposal; trouble shooting during incubation; incubation records.

Practicals:

Planning and designing of hatchery, Selection, candling and setting of hatching eggs; cleaning of hatching eggs; Preparation of eggs for incubation; dead embryo and dead in shell; estimation of fertility and hatchability. Trouble tracing chart of the chick embryo; demonstration of parts of incubators; handling of incubators; Practical: demonstration of sexing, grading, detoxing, and dubbing of baby chicks; disinfection and fumigation of incubators; visits to commercial hatcheries.

Suggested Readings

1. Bell, D.D. and W.D. Weaver. 2007. Commercial Chicken Meat and Egg Production. 5th Ed. Springer Pvt, Limited, India.
2. Brown, T. 2010. Poultry Farming. Apple Academic Press 3333 Mistwell Crescent Oakville, ON 6L6 0A2.
3. Prasad, R. 2010. Poultry Management. Alpha Publications, New Delhi, India.
4. Taylor, L.W. 2003. Fertility and Hatchability of Chicken and Turkey Egg. International Book Distributing Co., Lucknow, India

Learning Objectives

After studying this course the students would be able to

- Importance of housing in management of poultry.
- Basic tools while construction of poultry shed.
- Well enough to establish the poultry farm.

Theory:

Importance of poultry housing: selection of site and location of poultry house; modern trends in poultry housing system; types and styles of poultry houses; construction of poultry farm buildings. Pre cast poultry house material availability and price structure; heating and cooling systems; role of insulation in environment control housing; ventilation principles, procedure and equipment, orientation and design of buildings in relation to environment; open-sided and environmentally controlled housing; housing conditions and poultry welfare; brooding, rearing and laying house equipment; alternative power supply; farm water supply; sewage disposal.

Practicals:

Basic principles for poultry house construction. Demonstration of poultry farm buildings; designing of farm buildings for specific purposes; demonstration and operation of poultry farm equipment; use of AutoCad, automatic feeding and watering system, specifications, cost estimation and trouble-shooting; poultry housing practices. Visit to poultry farms.

Suggested Readings

1. Brown, T. 2010. Poultry Farming. Apple Academic Press 3333 Mistwell Crescent Oakville, ON 6L6 0A2.
2. Dagher, N.J. 2008. Poultry Production in Hot Climates. 2nd Ed. CABI Publications. Wallingford Oxon OX 10 8DE, UK.
3. Prasad, R. 2010. Poultry Management. Alpha Publications, New Delhi, India.

Learning Objectives

After studying this course the students would be able to

- Explain about the basic concepts of genetics.
- Solve problems related to central tendencies and dispersion.
- Different statistical analysis in animal production.

Theory:

Population Genetics: Gene and genotypic frequency. Hardy-Weinberg Law, forces affecting gene frequency and composition of population, effective population size. Quantitative Genetics: Quantitative characters and their inheritance. Biometry, biological population and its parameters; Statistical methods in animal production: measures of central tendency and dispersion for quantitative traits. Genetic parameters; Concepts of heritability, repeatability, correlations and regression. Experimental designs. Nature and causes of variation in quantitative traits. Concepts of breeding value. Lethal and semi-lethal genes, deletion and elimination of lethals from poultry populations.

Practicals:

Exercises on gene and genotypic frequencies. Problems related to central tendencies and dispersion. Exercises on the estimation of heritabilities, repeatabilities, genetic correlation and breeding values from given data.

Suggested Readings

1. Gillespie, J.L. 2004. Population Genetics: A Concise Guide. 2nd Ed. The Johns Hopkins University Press, USA.
2. Hamilton, M. 2009. Population Genetics. John Wiley and Sons, CA, USA.
3. Hartl, D.L. and A.G. Clark. 2007. Principles of Population Genetics, 4th Ed. Sinauer Associates.
4. Sokal, R.R. and F.J. Rohlf. 1995. Biometry. W.H. Freeman and Co., New York, USA.

Learning Objectives

After studying this course the students would be able to

- Knowledge about the different minerals and vitamins.
- Importance of minerals and vitamins in diet.
- Able to formulate the animal/ poultry feed.

Theory:

Historical perspective of minerals and vitamins, Essential minerals elements and their distribution in living body, Classification and their functions, General mineral metabolism and interaction, Interrelationship and deficiency of calcium, phosphorus, magnesium, sodium, potassium, chlorine, iron, copper, cobalt, manganese, iodine, molybdenum, fluorine, zinc and selenium. Relationship of minerals with other dietary ingredients, Vitamins: nomenclature, nature and classification, Vitamin Requirements, stability, interdependence, deficiencies and toxicity. Metabolic functions of vitamins. Interrelationship among vitamins and with other nutrients, Different available sources of minerals and vitamins.

Practicals:

Sample preparation for mineral analysis. Estimation of important inorganic elements and vitamin C in common feed ingredients.

Suggested Readings

1. Leeson, S. and J.D. Summers. 2001. Nutrition of the Chicken. International Book Distributing Co., Lucknow, India.
2. McDonald, P., R.A., Edwards Ad, J.F.D. Greenhalgh and C.A. Morgan. 2002. Animal Nutrition. Longman Scientific and Technical England, UK.
3. McDowell, L.R and L.R. McDowell. 1992. Minerals in Animal and Human Nutrition. Academic Press Inc. California, USA.
4. NRC. 2005. Mineral Tolerance of Animals. National Academy of Sciences, USA.

Learning Objectives

After studying this course the students would be able to

- Different terminology used in microbiology.
- Knowledge about bacteria and its application in life.
- Different types of immunity.
- Know about the mechanisms of different types of immunity.

Theory:

Introduction to General Microbiology, Microbiology: Definition and branches of microbiology, The Place of Microorganisms in the Living World, Historical introduction including work of Pasteur, Koch, Lister and recent developments. Prokaryotes vs eukaryotes. Characteristic of Microorganisms (Morphological characteristics, Chemical composition, Cultural characteristics, metabolic characteristics, Antigenic characteristics, Genetic characteristics and Pathogenicity etc). Bacterial Growth and Multiplication: Physicochemical requirement; pH, temperature, oxidation reduction potential, gaseous and nutritional requirements, etc. Types of culture media; bacterial multiplication and growth curves, continuous culture. Bacterial preservation. Bacterial genetics: Mutation and mutagenesis, transposons, conjugation, transformation, transduction, plasmids and their importance, lysogeny, introduction to genetic engineering. Fungi: Introduction to fungi. moulds and yeasts, growth requirements and modes of replication. Immunology: Introduction to immunity. Innate (non specific) immunity: natural barriers of defense, phagocytes and complement system. Classical and alternative complement pathways. Acquired immunity; types, immune responses. Antigens and antigenicity: Essential features of antigens, epitope, cross-reactivity. macrophage and antigen processing and presentation, other antigen presenting cells, fate of foreign materials within the body. Cells and organs of the immune system (poultry): B and T lymphocytes, cell interactions, immunoregulators, regulation of immune system, immune tolerance. Major histocompatibility complex (MHC): MHC of domestic poultry birds. Immunoglobulins: structure, isotypes, theories of antibody formation, monoclonal antibodies and hybridomas, immunoglobulins of domestic poultry. Hypersensitivity: Types and mechanisms with examples of poultry importance. Vaccines and vaccination in poultry: Immunization procedures, methods of vaccine production, vaccine administration, adverse consequences of vaccination Immunomodulations: Immunosuppression, immunostimulation and immunopotential, adjuvants. Autoimmunity, autoimmune diseases and tumour immunology.

Practicals:

Safety in the microbiological laboratory, demonstration of laboratory equipments, their basic functions and handling. Microscope and microscopy: Bright field, dark field, phase contrast, fluorescent, etc. Sterilization and disinfection: Physical agents including moist heat, dry heat, ionizing radiation, filtration, etc. Chemical agents, factors influencing activity, evaluation of antimicrobial activity (phenol coefficient). Bacteriological media: Preparation and demonstration of various culture media: (basic, enriched, selective, differential, enrichment, transport and

storage media). Stains and staining: Simple (Loeffler's methylene blue staining, differential (Gram's and acid fast), special (flagella, capsule, spores, etc.). Methods of bacterial cultivation and growth. Bacterial colonies: Types and characteristics. Morphology: Shape and arrangement, micrometry and motility. Antibiotic sensitivity testing. Methods of antigen and hyperimmune sera preparation. Demonstration of sero-diagnostic methods like precipitation and agglutination. Demonstration of delayed hypersensitivity testing.

Suggested Readings

1. Alcamo, I.E. 2001. Fundamentals of Microbiology. Jones and Bartlett Pub, Massachusetts, USA.
2. Talaro, K.P. and A. Talaro. 2002. Foundation in Microbiology. McGraw Hill Co., New York, USA.
3. Tizzard, I.R. 1999. An Introduction to Veterinary Immunology. W.B. Saunders Co., London, UK.
4. Tortora, G.J., B.R. Funke and C.L. Case. 2004. Microbiology- An Introduction. 8th Ed., Pearson Edu. Inc., California, USA.

STAT-302

Introductory Statistics

2(2-0)

Learning Objectives

After studying this course the students would be able to

- Identify completely randomized designs, factorial designs, and complete block designs
- Perform correct analysis of experimental data using SAS.
- Data analysis and interpretation.

Theory:

Introduction and scope of biostatistics. Types of data, Scales of measurements, Frequency distribution for discrete and continuous data. Visual representation of data, stem and leaf display, box-whisker plots, Measures of location and dispersion. kurtosis and skewness. Rates and ratios. Sampling distribution of mean and difference between means and its properties. Testing of hypothesis for mean, proportion, difference between means and difference between proportions. one way and two way ANOVA. Test of independence. Regression and correlation.

Practicals:

Introduction to computers and operating systems, laboratory and field experiments, statistical concepts and methods widely used in biomedical research. Installation+ use of MINITAB. Data Entry and import data from Excel, Manipulation of data and transformation. of computer output regarding the methods learned in theory.

Suggested Readings

1. Margaret, S, and Pepe. 2003. The Statistical Evolution of Medical Tests for Classification and Prediction. Oxford University Press, New York, USA.

2. Minitab User's manual, 2010.
3. Muhammad, F. 2000. Statistical Methods and Data Analysis. KitabMarkaz, BhawanaBazaar, Faisalabad.
4. Zar, J. 2005. Biostatistical Analysis. 8th Ed. John Wiley and Sons, New York, USA.
5. Zhou, X.H., N.A. Obuchowski, and D.K. McClish. 2002 Statistical Methods in Diagnostic Medicine. John Wiley and Sons, New York, USA.

PS-402

Poultry Farm Management

3(2-1)

Learning Objectives

After studying this course the students would be able to

- Manage the poultry farm.
- Able to manage farm in different stages of poultry life.
- Basic concepts and practices involve in poultry farm management.

Theory:

Preparation for receiving baby chicks; brooding requirements and management during brooding; rearing, shifting and housing of pullets; cage vs floor management; broiler production and management; lighting management for various age groups; managerial practices affecting egg and meat production; management of flock during hot and cold climates; causes of poor performance of layer and breeder flocks; managemental problems; vices and their remedies; induced moulting of spent hens and breeders; poultry welfare; poultry waste management: composition and usage; characteristics of an ideal owner and poultry farm manager; cost benefit ratio of different poultry enterprises; significance of record keeping; computerized record keeping.

Practicals:

Demonstration and handling of various types of brooders; vaccination, medication, beak trimming and toe punching; remedies for vices in poultry; preparation of birds for transportation; use of computers in farm records.

Suggested Readings

1. Bell, D.D. and W.D. Weaver. 2007. Commercial Chicken Meat and Egg Production. 5th Ed. Springer Pvt. Limited. India.
2. Brown, T. 2010. Poultry Farming. Apple Academic Press 3333 Mistwell Crescent Oakville, ON 6L6 0A2.
3. Prasad, R. 2010. Poultry Management. Alpha Publications New Delhi, India.
4. Sreenivasaih, P.V. 2006. Scientific Poultry Production. 3rd Ed. International Book Distributing Co. Lucknow, India.

Learning Objectives

After studying this course the students would be able to

- Know about basic knowledge of poultry feed.
- Evaluate the poultry feeds.
- Prepare home feed mixing.

Theory:

Importance of poultry feeding; feeding methods, their advantages and disadvantages; range and backyard feeding; various forms of feeds; quality of feed and water in relation to performance of chicken; factors affecting the quality of feed ingredients and feeds; feed and water space requirements; manual vs. automatic feeding system; deleterious substances in poultry feeds; storage of commercial poultry feeds to maintain quality; various types of rations and phase feeding; measures to avoid wastage of feed.

Practicals:

Different feeding methods/practices evaluation of poultry feeds on the basis of gross examination; storage of commercial feeds at poultry farm; mixing of feed additives in poultry feeds; home feed mixing. Visit to feed mill.

Suggested Readings

1. Bell, D.D. and W.D. Weaver. 2007. Commercial Chicken Meat and Egg Production. 5th Ed. Springer Pvt. Limited, India.
2. Dagher, N.J. 2008. Poultry Production in Hot Climates. 2nd Ed. CABI Publications. Wallingford Oxon OX10 8DE, UK.
3. Leeson, S. and J.D. Summers. 2002. Nutrition of the Chicken. 4th Ed. International Book Distributing Co. Lucknow, India.
4. Prasad, R. 2010. Poultry Management. Alpha Publications, New Delhi, India.

Learning Objectives

After studying this course the students would be able to

- Basic concept about broiler and its origin.
- Monitoring of growth performance of broilers
- Management of broiler throughout the life span.

Theory:

Introduction, origin of broiler, different breeds/strains used in broiler development; housing, equipment and floor space requirements; open sided and environment control housing; water, feed and litter management; preparation for chicks arrival, procurement of quality chicks; chick placement; brooding requirements, managing broilers on litter; lighting regime for broilers; feed specifications; growth and feed consumption, measuring feed conversion ratio, sex separate raising; bio-security, health management; control measures for specific broiler diseases; food safety issues, broiler rearing problems; marketing broilers; trouble shootings in broilers; economical broiler production.

Practicals:

Pre-brooding and brooding management. Vaccination schedule for broilers, feeding strategies for broiler, monitoring of growth performance of broilers viz. weekly feed consumption, weekly weight gain, mortality, feed to gain ratio, European efficiency factor; preparation feasibility reports; visit of broiler farm.

Suggested Readings

1. Bell, D.D. and W.D. Weaver. 2007. Commercial Chicken Meat and Egg Production. 5th Ed. Springer Pvt. Limited, India.
2. Brown, T. 2010. Poultry Farming. Apple Academic Press 3333 Mistwell Crescent Oakville, ON 6L6 0A2.
3. Dagher, N.J. 2008. Poultry Production in Hot Climates. CABI Publications. Wallingford Oxon OX 10 8DE, UK.
4. Jadhav, N.V. and M.F. Siddiqui. 2007. Handbook of Poultry Production and Management. Jaypee Brothers Medical Publishers (Pvt) Ltd. New Delhi, India.
5. Prasad, R. 2010. Poultry Management. Alpha Publications New Delhi, India.

Learning Objectives

After studying this course the students would be able to

- Inspect the poultry meat and ensure the quality.
- Check the wholesomeness of meat.
- Basic concepts of processing and preservation of poultry meat.

Theory:

Objectives of meat inspection; Standards and grades for quality identification; Laws governing the poultry meat inspection; evidence of disease. antemortem inspection, postmortem inspection: Hazard analysis and critical control point system; Pathogenic organisms; Spoilage organisms, retarding the growth of these microorganisms; Microflora on poultry meat products; the use of water in poultry processing, water quality, sewage disposal; Processing plant layout and sanitation.

Practicals:

Introduction to poultry meat: Wholesomeness of meat; Grading fresh poultry: Processing fresh poultry, assembling, weighing. slaughtering and defeathering, evisceration, sorting carcasses, chilling, ice packaging in boxes; Biochemical and physical examination of poultry meat; visits to poultry processing plants.

Suggested Readings

1. Bell, D.D. and W.D. Weaver. 2007. Commercial Chicken Meat and Egg Production. 5th Ed. Springer Pvt, Limited. India.
2. Brown, T. 2010. Poultry Farming. Apple Academic Press 3333 Mistwell Crescent Oakville, ON 6L6 0A2.
3. Richardson, R.I. and G.C. Mead. 2005. Poultry Meat Science. Researchco Book Center, New Delhi, India.

AN-404

Feed Evaluation, Formulation & Processing Technology

3(2-1)

Learning Objectives

After studying this course the students would be able to

- Formulate the feed for different classes of poultry.
- To conduct the basic feed trial to different classes of poultry.
- Manufacturing of compound feeds

Theory:

Techniques for estimating nutritive value of feedstuffs and their validity; factors affecting nutritive value of feeds; measures of feed quality for poultry; protein efficiency ratio, biological value, the essential amino acid index; protein evaluation systems; natural toxicants of feeds and detoxification; feeding system for poultry; feed raw material handling, storage, grinding, mixing, processing and storage of finished feed; quality control in feed processing; forms of feeds and least cost ration formulation for poultry; feedstuff laws and regulations.

Practicals:

Use of computer for least cost feed formulation for various classes of poultry, availability pattern of feed stuffs in local market and their price structures. Manufacturing compound feeds. Demonstration of feeding trials for estimating feed efficiency. Visit of feed mills.

Suggested Readings

1. Cheeke, P.R. 2005. Applied Animal Nutrition: Feeds and Feeding. 3rd Ed. Pearson Prentice Hall Inc. New Jersey, USA.

2. Kellems, R.O. and D.C. Church. 2009. Livestock Feeds and Feeding. Prentice Hall Inc. New Jersey, USA.
3. McElhiney, R.R. 1994. Feed Manufacturing Technology IV. American Feed Industry Association (AFIA), Co., Clovis, California, USA.
4. McDonald, P., R.A. Edwards Ad, J.F.D. Greenhalgh and C.A. Morgan. 2002. Animal Nutrition. Longman Scientific and Technical England, UK

Learning Objectives

After studying this course the students would be able to

- Have effective communication.
- Have ability to develop the leadership.
- Qualify the TOEFL/IELTS.

Theory:

Definition, types and functions of communication; Effective communication and its barriers; Process and networks communication; Verbal communication skills; speaking, listening, reading and writing, Development of effective reading skills; Listening; the process, types, barriers and strategies for effective listening; Preparing and delivering a speech; Art of effective writing, writing scientific and popular articles; Non-verbal communications skills: characteristics, functions and types; Leadership, process, styles, functions and characteristics; Development of effective leadership skills.

Practicals:

Students will be assigned independent topics for practicing communication skills (speaking, writing, listening and reading) in the class. Each student will analyze existing leadership in the given community and practicing the TOEFL/IELTS.

Suggested Readings

1. Journals AIAEE and www.fao.org
2. Memon, R.A. and E. Bashir. (Ed.). 1997. Extension Methods. National Book Foundation, Islamabad.
3. Muhammad, S. 2007. Communication Skills and Leadership Development, Unitech Communication, Faisalabad.
4. Peter G.N. 2010. Leadership: Theory and Practice. SAGE Publication Pvt. Ltd. India.
5. Ray, G.L. 2003. Extension Communication and Management. Kalyani Publishers, New Delhi, India.

Learning Objectives

After studying this course the students would be able to

- Have basic concept about biosecurity.
- Specimen collection for dispatch to the diagnostic laboratory
- Develop the biosecurity measures of poultry farm.

Theory:

Importance of poultry hygiene; bio-security measures; terms related to poultry diseases; cleaning and disinfection of poultry houses and equipment, disinfectants and their application; fumigation and its importance; principal aspects of management and disease prevention; prophylactic measures against bacterial viral, parasitic and mycotic diseases; nutritional disorders and their

prevention; significance of drinking water in relation to diseases; practices involved in controlling vertically and horizontally transmitted diseases.

Practicals:

Poultry carcass inspection; blood and carcass specimen collection for dispatch to the diagnostic laboratory; vaccines and vaccination; disinfectants, medicines and vaccines available in market; common practices for bio-security measures; dead bird disposal.

Suggested Readings

1. Charlton, B.R., A.J. Bermodaz, M. Boulianne, D.A. Halvorson, J.S. Schrader, L.J. Newman, J.E. Sander and P.S. Wakenell. 2006. Avian Disease Manual. American Association of Avian Pathologists, USA.
2. Haq, A. and T. Ahmad. 2001. Poultry Hygiene and Disease Prevention. Pak Book Empire, Lahore, Pakistan.
3. Saif, Y.M., H.J. Barnes, J.R. Gallisson, A.M. Fadly, A.R. McDougald and D.E. Swayne. 2003. Diseases of Poultry. 11th Ed. Jaypee Brothers Medical Publishers (Pvt) Ltd, New Delhi, India.
4. Vegad, J.L. 2004. Poultry Diseases: A Guide for Farmers and Poultry Professionals. International Book Distributors Co, Lucknow, India.

PS-503

Layer Production and Management

3(2-1)

Learning Objectives

After studying this course the students would be able to

- Basic concept about layer and its origin.
- Management of layer throughout the life span.
- Successful management of layer farm.

Theory:

Present status and future scope of layer farming; housing systems; pre-brooding requirements; procurement of quality chicks; management during brooding period; controlling early chick mortality; management during rearing; shifting and housing of pullets; feed and light management to control sexual maturity; management practices during laying for efficient egg production; nest management and egg collection; causes of poor performance in layers: prevention and control of common layer diseases; parasitic control; vices and their remedies in layer production; management in hot and cold environment; induced molting; trouble shootings; litter management and waste disposal; record keeping; marketing of eggs and spent hens.

Practicals:

Demonstration of various types of brooders; vaccination and medication practices; beak trimming; identification of laying and non-laying; cost benefit ratio of layer enterprises; induced molting techniques; managing flock during stress; computerized record keeping; feasibility report of layer flocks; visit of a layer farm.

Suggested Readings

1. Bell, D.D. and W.D. Weaver. 2007. Commercial Chicken Meat and Egg Production. 5th Ed. Springer Pvt. Limited, India.
2. Brown, T. 2010. Poultry Farming. Apple Academic Press 3333 Mistwell Crescent Oakville, ON 6L6 0A2, UK.
3. Dagher, N.J. 2008. Poultry Production in Hot Climates. CABI Publications. Wallingford Oxon OX 10 8DE, UK.
4. Prasad, R. 2010. Poultry Management. Alpha Publications New Delhi, India.
5. Sreenivasaih, P.V. 2006. Scientific Poultry Production. 3rd Ed. International Book Distributing Co. Lucknow, India

PS-505

Poultry Farm Practices-I

1(0-2)

Learning Objectives

After studying this course the students would be able to

- Basic concept about various practices involve in poultry management.
- Manage the poultry farm successfully.
- Have technological knowledge about various farm level practices.

Theory:

Preparation of brooding room; shifting of baby chicks to the brooding room; control of early chick mortality; comparative brooding and rearing practices for different species of poultry birds; remedies for common vices in poultry flocks; adult flock management; vaccination and medication practices; selection and culling of birds; maintenance of poultry farm registers; economic appraisal of broiler, layer and breeding flocks; disposal of poultry waste; cleanliness and disinfection of farm buildings. Evaluation of hatching egg quality: practices involved in the maintenance of hatching eggs quality; routine hatchery practices, trouble shooting and their remedies; economic appraisal of hatchery business; bio-security measures in hatchery operation;

Suggested Readings

1. Haq, A. and M. Akhtar. 2004. Poultry Farming. Higher Education Commission, H-9, Islamabad, Pakistan.
2. Jull, M.A. 2003. Successful Poultry Management. Bio-Tech Books, New Delhi, India.

ABG-501 Applied Poultry Breeding

3(2-1)

Learning Objectives

After studying this course the students would be able to

- Maintain and standardize the poultry farm record.
- Selection and development of breeding stock for layers & broilers.
- Estimation of breeding values using standardized records

Theory:

Traits of economic importance in poultry, opportunities for breeding and improvement of poultry breeds in Pakistan, selection of poultry birds for genetic improvement, use of

standardized records, relative economic values, breeding values and selection indices, crossbreeding for egg and meat production. Selection and development of breeding stock for layers, broilers, dual purpose chicken and rural poultry. Review of the poultry breeding practices used by the developed countries. Future breeding plans for genetic improvement of poultry in different agro-ecological zones of Pakistan.

Practicals:

Exercises on the maintenance and standardization of productive and reproductive records. Estimation of breeding values using standardized records. Calculation of relative economic values, Construction of selection indices for breeding value estimation.

Suggested Readings

1. Crawford, R.D. 1990. Poultry Breeding and Genetics. Elsevier Science Publishers, Amsterdam, The Netherlands.
2. Hartl, L. 2009. Genetics: Analysis of Genes and Genomes. 7th Ed. Jones and Bartlett Publishers, Inc. Sudbury, MA, USA.
3. Muir, W.M. and S.E. Aggery. 2003. Poultry Genetics, Breeding and Biotechnology. CABI Publications. Wallingford Oxon, UK.
4. Nicholas, F.W. 1996. Veterinary Genetics. Clarendon Press, Oxford, UK.

FMP-507 Farm Equipment, Structure & Processing 4(3-1)

Learning Objectives

After studying this course the students would be able to

- Knowledge about different machinery at farm level.
- Repair and maintenance of different machineries used at farm.
- Cost analysis of machine used at farms.

Theory:

Farm Power and Equipment: Sources of farm power, engine types, systems and mechanisms, Farms equipment: primary secondary and inter cultural equipment. Farm Housing: Introductions, farm structures and materials, Characteristic and performance of construction materials, Types of concrete mix, reinforced structures, masonry blocks. Wood materials, structures in timber, Structures joints, panel product and wall covering. Selection of materials: structural requirements for environment control of poultry, thermal insulation, heat producing unit, natural ventilation, thermal buoyancy forced ventilation, blower/exhaust of farm sheds, Water requirements for poultry farms. Water management and recycling of materials, energy production from poultry waste. Processing. Engineering: Introduction to process engineering, poultry processing machines and equipment, poultry mechanization system, strategy and technology transfer, requirements for processing, packing and handling equipment of poultry products, feed mixers and their types.

Practicals:

Study of maintenance schedule of tractor. Maintenance requirements of farm equipment and machines, Cost analysis of machine used at farms. Study of maintenance procedure of farm structures. Study of poultry farms at University campus. Preparation of poultry shed temperature control chart. Study of ventilation systems at a farm shed. Maintenance of Farm Buildings, Preparation of machine use plan for poultry farms, Student project for one of the poultry flocks. Visit of poultry sheds in various regions of Pakistan (plains and hill areas)

Suggested Readings

1. CIGR. 1999. Handbook of Agri. Engineering- Animal Production and Aquaculture Engineering. New York, USA.
2. CIGR. 1999. Handbook of Agri, Engineering- Plant Production Engineering. New York, USA.
3. Harold, E.G. 1995. Farm Services Building. McGraw-Hill Book Co., USA.
4. Tahir, A.R. and M.S. Sabir. 2003. Fundamentals of Tractor and Agricultural Machinery, University of Agriculture, Faisalabad.

Med-501 Poultry Medicine

3(2-1)

Learning Objectives

After studying this course the students would be able to

- Knowledge about different diseases of poultry.
- Diagnosis of different poultry diseases.
- Treatment of different poultry diseases.

Theory:

History and scope of Medicine, branches of medicine, principles of medication and treatment in poultry birds. Concept of poultry health, human avian bond, Basic concept of etiology, clinical signs, diagnosis, treatment and control of important diseases of commercial and domestic poultry (Hydro-pericardium syndrome, Inclusion body hepatitis, Newcastle disease, Avian infectious anemia, Streptococcosis, Avian Tuberculosis, Mycoplasmosis, Colibacillosis, Salmonellosis, Infectious stunting syndrome Infectious Coryza, Fowl cholera, spirochaetosis, Brooder,s pneumonia, Infectious bursal disease, Egg drop syndrome, Infectious bronchitis, Marek,s Disease, Infectious laryngotracheitis), Deficiency/metabolic diseases of poultry, reproductive tract diseases, infertility, heat and chill stress, mycotoxicosis, cannibalism. Vaccination programs against infectious diseases for commercial and rural poultry. Disinfectants types and uses in poultry sheds. Disease outbreak handling, Prophylactic measures for controlling poultry related zoonotic diseases.

Practicals:

History and Clinical examination of the sick and healthy birds , Handling and care of sick birds, Case records, Interpretations of clinical and laboratory findings, Collection, preservation and transport of samples from farm to diagnostic laboratory, Evaluation of the hydration status of the

birds, Fluid therapy, Methods of drug administration, Therapeutic dose calculation through weight estimation of the birds. Crop tubing.

Suggested Readings

1. Anjum, A.D. 1997. Poultry Diseases. 2nd Ed. Vet-Ag Publications, Faisalabad, Pakistan
2. Chakrabarti, 2008, Practice of poultry medicine. Kalyani publishers, New Dehli, India
3. Pattison, M., F. P. McMalin, M. J. Bradbary and D. J. Alaxander, 2017. Poultry Disease 6th ED. Elsevier Punlication.
4. Saif, Y.M., H.J. Barnes, J.R. Glissen, A.M. Fadly, L.R. McDoughald and D.E. Swayne (Ed.). 2001. Poultry Diseases 11th Ed. Iowa State University Press, Ames, Iowa, USA.

PS-502

Fancy Bird Production

3(2-1)

Learning Objectives

After studying this course the students would be able to

- Housing and management of fancy and game birds.
- Know about transportation and quarantine measures.
- Prevention of different diseases of fancy and game birds.

Theory:

Origin and domestication of fancy birds and their species. Scope of game and fancy birds in developing countries. Housing systems, aviaries and equipment. Floor space, feeder and drinker space requirements. Care during brooding and growing. Age at maturity, Measures during production periods. Management and feeding of quail, ducks, turkey, pigeon, falcons, bantams, pea-fowls, pheasants, waterfowls, geese, swans and ostrich. Incubation methods and periods. Male to female ratio, sexing baby chicks, seasonal influence on reproduction, handling and storage of hatching eggs. Factors affecting hatchability. Common diseases, disorders and their control. Transportation of fancy birds and quarantine measures. Economics and marketing of fancy birds. Preparing birds for shows.

Practicals:

Housing for game and fancy birds. Bio-security and hygiene measures. Parasites and their control. Postmortem and diagnosis of different diseases. Visits to game bird market.

Suggested Readings

1. McNab, J. and K.N. Boorman. 2002. Poultry Feeds: Supply, Composition and Nutritive Value. CABI Publishing, Nosworthy Way, Willingford, Oxfordshire, OX 10 8DE, UK.
2. Shanaway, M.M. 1994. Quail Production Systems. A review. FAO, Rome, Italy.
3. Stromberg, L. 1977. Sexing All Fowl Baby Chicks, Game Birds, Cage Birds. Stromberg Publishing Co. Pine River, Minnesota, MN, USA.
4. Taylor, L.W. 2003. Fertility and Hatchability of Chicken and Turkey Egg. International Book Distributing Co. Lucknow, India.

Learning Objectives

After studying this course the students would be able to

- Maintain and standardize the breeder poultry farm.
- Knowledge about different managerial practices involve at farm.
- Manage the breeder farm.

Theory:

Introduction, historical perspective of breeder production; breeder house layout and equipment requirements; environment control vs open sided housing; care and management during brooding period; rearing management; light and feed management during growing; monitoring body weights, uniformity, grading and selection during growing period; skip a day feeding; vaccination programs during growing; sexing errors; prebreeder nutrition; feeding programs for adults; production standards; male to female ratio; sex separate feeding system; nest management; egg collection, handling and cleaning; fumigation of hatching eggs; spiking. causes of poor fertility and hatchability; major management health concerns with breeders; labour management; summer and winter strategies to enhance production; induced molting in breeder flocks; trouble shooting in breeder flocks; record keeping.

Practicals:

Environment control housing; ventilation and heating systems; reproductive system of male and female; vaccination programs; blood and tissue sampling; feeding management; monitoring body weights and uniformity calculations during growing; male management; sex separate feeding system; hatching egg fumigation, storage and transportation; toe clipping, dubbing and beak trimming; calculating cost of producing hatching eggs and chicks; feasibility report of broiler and layer breeder flocks; record keeping; visit of poultry breeder farm.

Suggested Readings

1. Bell, D.D. and W.D. Weaver. 2007. Commercial Chicken Meat and Egg Production. 5th Ed. Springer Pvt. Limited. India.
2. Brown, T. 2010. Poultry Farming. Apple Academic Press 3333 Mistwell Crescent Oakville, ON 6L6 0A2.
3. Jadhav, N.V. and M.F. Siddiqui. 2007. Handbook of Poultry Production and Management. Jaypee Brothers Medical Publishers (Pvt) Ltd. New Delhi, India.
4. Leeson, S. and J.D. Summers. 2001. Broiler Breeder Production. University Book Foundation, University of Guleph, Canada.

Learning Objectives

After studying this course the students would be able to

- Basic concept about various practices involve in poultry management.
- Manage the poultry farm successfully.

- Have technological knowledge about various farm level practices.

Theory:

Introduction, different practices for broilers: incubation, chick grading, chick sexing, hatchery vaccination, hatchery losses. Brooding and growing; brooding temperature, litter management, light management during broiler production, chick guards, feeding and watering procedures. Environment; calculations regarding housing and equipment. measuring ventilation and air quality. Health maintenance programs; bio-security measures, immunization, cleaning and disinfection of broiler houses and equipment; preventive medication. monitoring mortality, dead bird disposal. Minimizing nuisance aspects of farms; air quality, manure management and odor control, fly control, landscaping. Bird handling and transportation.

Suggested Readings

1. Haq, A. and M. Akhtar. 2004. Poultry Farming. Higher Education Commission, H-9. Islamabad. Pakistan.
2. Jadhav, N.V. 2003. Practicals: Manual of Avian Production and Management. Jaypee Brothers Medical Publishers (Pvt) Ltd. Delhi, India.
3. Jull, M.A. 2003. Successful Poultry Management. Bio-Tech Books Delhi, India.

AN-502

Principles of Poultry Nutrition

4(3-1)

Learning Objectives

After studying this course the students would be able to

- Knowledge about composition of feedstuffs used in poultry rations.
- Formulation of feed of different classes of poultry.
- Economics of poultry rations.

Theory:

Sources of nutrients; cereals and their by-products, fats and oils, animal and vegetable protein supplements, mineral and vitamin supplements. Feed composition tables, Nutrient requirements and specifications, Feed additives: antibiotics, coccidiostats, antioxidants, probiotics, enzymes. Metabolic antagonistic and incompatibilities in mixed feed, vitamin antagonists, amino acid antimetabolites, goitrogens, drug toxic substances in poultry feeds. Nutrient requirements of commercial layers and broilers, meat and egg type breeders, quails, ducks and turkeys. Interrelationships of nutrients.

Practicals:

Composition of feedstuffs used in poultry rations, Characteristics of poultry rations, Formulation of rations for broilers, layers and breeders, quails, ducks and turkeys, Economics of poultry rations. Visit to feed mills.

Suggested Readings

1. Leeson, S. and J.D. Summers. 2008. Commercial Poultry Nutrition. 3rd Ed., Nottingham University Press, UK.
2. McNab, J. and K.N. Boorman. 2002. Poultry Feeds: Supply, Composition and Nutritive Value. CABI Publishing, Nosworthy Way, Oxfordshire, OX10 8DE, UK.

3. NRC. 1994. Nutrient Requirements of Poultry. National Academy of Science, USA.
4. Reddy, V.R and D.T. Bhosale. 2004. Handbook of Poultry Nutrition. International Book Distributing Co, Lucknow, India.

MAB-601 Agri-Business Management, Marketing and WTO

4(4-0)

Learning Objectives

After studying this course the students would be able to

- Manage the business related to Agriculture sector.
- Market the product to local market effectively.
- Market the product according to international standards.

Theory:

Definition, concepts and scope of Agri.Business Management, Functions of management: planning, organizing, directing, controlling, forms, Forms of business organization: single proprietorship, partnership, company organization, Cooperatives in Agri. Business. Agri. Business financial management. Managing human resources in Agri. Business. Definition of market and marketing. Role of Agri. Marketing in economic development. Approaches to understanding agricultural marketing problems. Marketing functions: standardization and grading, packaging, storage, transportation, intelligence, legislation and management of markets, market pools, marketing boards. Marketing problems and remedial measures. A brief history of General Agreement on Tariffs and Trade (GATT). Formation of the World Trade Organization (WTO); Objectives, basic principles and functions of the WTO. Structure, organization and dispute settlement mechanism of the WTO. Agreements under GATT/WTO: Agreement on Agriculture (AOA); and its three pillars: Market Access; Domestic Support; Export competition. Agreement on application of Sanitary and Phytosanitary measures (SPS). Agreement of Trade Related Intellectual Property Rights (TRIPs).

Suggested Readings

1. Beierlein, J.G., K.C. Schneeberger and D.D. Osburn. 2007. Principals of Agribusiness Management. 4th Ed. Waveland Pvt Inc. USA.
2. Erickson, S.P., J.T. Akridge, F.L. Barnard and W.D. Downy. 2002. Agribusiness Management. 4th Ed. McGraw-Hill Inc. New York, USA.
3. Kotler, P. and G. Armstrong. 2011. Principals of Marketing. 14th Ed. Prentice Hall Co., New Jersey, USA.

Learning Objectives

After studying this course the students would be able to

- Calculation of risk factors and managing them.
- Knowledge about different terms and procedures related to Epidemiology.
- Able to co-relate and manage the diseases regarding public health.

Theory:

Epidemiology: Orientation to epidemiology relevant definitions evolution of epidemiology types of epidemiology (conventional clinical molecular and environmental) uses of epidemiology in disease investigations and control. General Concepts of Epidemiology: Domains of clinical and population (Flock) medicine patterns of disease occurrence (endemic, sporadic, epidemic and pandemic); Population and its types; Koch's & Evan's postulates; Variables and their types; Association between variable; types of association; causal models of a disease; Formulation of causal hypothesis of a disease; Measures of disease frequency (point prevalence, period prevalence, cumulative incidence, incidence rate, mortality rate, case fatality rate, attack rate etc.); Temporal and spatial distribution of diseases. Determinants/Risks Factors: Classification of determinants; Primary and secondary determinants, intrinsic and extrinsic determinants, Determinants associated with host, agent and environment; Interaction of determinants. Identification of Determinants/Risk Factors: Surveys; types of epidemiological studies; sampling methods and sample size consideration in epidemiological investigations; Cross sectional, case-control and cohort studies. Measurement of association between risk factor (s) and disease. Sources and Transmission of Infection: Horizontal transmission: vertical transmission: maintenance of infection, vector of disease. Sero-epidemiology: Sero-diagnostic tests of poultry importance; measurement of geometric mean titre (GMT); flock immune profiles; parameters of evaluation of diagnostic test (sensitivity, specificity, predictive value, etc.). Active and passive surveillance of trans-boundary poultry diseases. Poultry Health Economics and Productivity Schemes: Value of economic analysis; Structure of health productivity schemes and poultry health productivity schemes. Epidemiological data: Sources of data; Representation (coding) of data; Computerized technique for recording of data: Current data on livestock/Poultry population in Pakistan. Public Health: Components of poultry medicine and their relation to human health, human health cost of poultry diseases in developed and subsistence economies of the world, the current and future role of veterinary medicine in combating hunger and malnutrition. An overview of veterinary public health services in developed and under developed countries. Zoonosis and their types (direct Zoonosis, cyclozoonosis, metazoonosis and saprozoonosis); important zoonotic diseases of poultry and their control. The role or veterinary profession in combating Zoonosis. The role of veterinary profession in producing safe human food, prevention of drug residues, implications and requirements of WTO agreement in relation to the food of poultry origin.

Practicals:

Epidemiology: Computerized and manual recording of epidemiological data and their analysis. Calculating the association of a risk factor with a disease in cohort and case-control studies. Investigation of a point source and propagative disease outbreaks. Construction of appropriate frequency polygons or histograms of temporal data Exercise in random and nonrandom sampling and calculation of appropriate sample size in a given epidemiological situation. Sample size in relation to inferential statistics, concept of power, bias and its type. Diagnostic tests for the detection of antibody titers against diseases of poultry. Evaluating the economic impact of a veterinary practice through partial and capital budgeting and decision analysis. Public Health: Microbiological examination of poultry meat and eggs for potential human health pathogens. Diagnostic technique for common Zoonotic diseases of poultry. Detection of antibiotic residues in poultry meat and eggs. Visits to poultry processing plant to examine the procedures of meat inspection.

Suggested Readings

1. Martin, W., A. Meek and P. Willeberg. 1987. Veterinary Epidemiology, Principles and Methods. Iowa State University Press, Ames, Iowa, USA.
2. Rothman, K.J. and G. Sander. 1998. Modern Epidemiology. 2nd Ed. Lipponcott Williams and Wilkins, London, UK.
3. Thrusfield, M. 2007. Veterinary Epidemiology. 3rd Ed. Blackwell Publishers, USA.
4. Gordis, L. 2009. Epidemiology. 4th Ed. Saunders Elsevier, Philadelphia, PA, USA.

PS-601**Poultry Products Technology****3(2-1)****Learning Objectives**

After studying this course the students would be able to

- Different poultry meat and egg processing techniques.
- Collection, handling, grading and quality parameters of the egg
- Preservation of products.

Theory:

Egg formation, structure, food value and chemical composition. Collection, handling, grading and quality parameters of the egg. Preservation of shell eggs and liquid eggs. Packaging and marketing of eggs. Collection, handling and transportation of live poultry, chemical composition and nutritive value of poultry meat. Slaughter techniques. Grading, quality control and standardization of poultry meat. Preservation of poultry meat. Processing, packaging and marketing of poultry meat.

Practicals:

Processing techniques for eggs and meat, Egg preservation techniques their advantages and disadvantages. Chemicals and drug residual effects and their control. Meat processing and preservation techniques. Feasibility report of poultry processing plant. Visit to processing plant.

Suggested Readings

1. Bell, D.D. and W.D. Weaver. 2007. Commercial Chicken Meat and Egg Production. 5th Ed. Springer Pvt. Limited. India.
2. Mounteny, G.J. and C.R. Parkhurst. 2001. Poultry Products Technology. Viva Books Pvt. Ltd. Delhi, India.
3. Richardson, R.I. and G.C. Mead. 2005. Poultry Meat Science. Researchco Book Center, New Delhi, India.
4. Stadelman, W.J. and O.I. Cotterill. 2002. Egg Science and Technology. CBS Publishers and Distributors, Delhi, India.

PS-603

Poultry Marketing and Economics

3(2-1)

Learning Objectives

After studying this course the students would be able to

- Different poultry marketing channels.
- Marketing of Poultry products.
- Prepare the feasibility of poultry farm.

Theory:

Poultry meat and egg marketing in Pakistan and abroad. The egg industry: structure and problems; prices, supply and demand; egg marketing problems. Economics of egg production: factors influencing the cost of production. Factors influencing profitability of egg production; planning for efficient poultry management; economic appraisal of the poultry farm business. Budgeting of the poultry enterprises. Poultry meat industry and its prospects; Prices, supply and demand; broiler marketing problems. Economics of broiler production; factors influencing the cost of broiler meat production. World trade organization and export of poultry and poultry products. Poultry industry and operational research, forecasting, transportation.

Practicals:

Marketing channels for meat and eggs in Pakistan. Economics of brooding, rearing and production periods. Calculating feasibilities for day-old chicks and parent flocks. Economic feasibility of meat and egg production. Record keeping.

Suggested Readings

1. Bell, D.D. and W.D. Weaver. 2007. Commercial Chicken Meat and Egg Production. 5th Ed. Springer Pvt. Limited, India.
2. Brown, T. 2010. Poultry Farming. Apple Academic Press 3333 Mistwell Crescent Oakville, ON 6L6 0A2.
3. Haq, A. and M. Akhtar. 2004. Poultry Farming. Higher Education Commission, H-9, Islamabad, Pakistan.

PS-605

Farm Records and Data Analysis

3(2-1)

Learning Objectives

After studying this course the students would be able to

- Use computers for best and effective record keeping.
- Analyze the data of farm and find the solution.
- Preparation of reports.

Theory:

Introduction to computer, computer input devices, output devices, storage devices, central processing unit, use of computer in poultry science, computer applications, operating system, introduction of Microsoft office; MS-Word, MS-Excel and MS-Access. Introduction to farm records; types of farm records, chick placement records, mortality, medication, vaccination, live weight, water, temperature, relative humidity, air quality and litter quality. Information from processing plant: carcass quality, health inspection, carcass composition and cleaning out. Preparation of daily, weekly, monthly and whole flock reports.

Practicals:

Use of computers. Introduction to various types of registers maintained at poultry farms, manual filling of the records, feeding of the records in computer. Preparation of reports manually and on the computers.

Suggested Readings

1. Shelly, G.B., T.J. Cashman, M.E. Vermaat. 2002. Discovering Computers: concepts for a digital world. Course Technology. 25-Thompson Place. Boston. MA. USA.
2. Walters, F. 1987. The Pakistan Poultry Industry. A Poultry Analysis Frame Work. Economic Analysis Net Project. Chemonics International, Consulting.
3. Bell, D.D. and W.D. Weaver. 2007. Commercial Chicken Meat and Egg Production. 5th Ed. Springer (Pvt) Ltd. New Delhi, India.
4. Sreenivasaih, P.V. 2006. Scientific Poultry Production. 3rd Ed. International Book Distributing Co. Lucknow, India.

AN-601

Poultry Feed Industry

4(3-1)

Learning Objectives

After studying this course the students would be able to

- Design feed mill layout and feasibility.
- Preparation of premixes for various classes of poultry.
- Ensure quality control of feed ingredients.

Theory:

History of feed industry in Pakistan; Feed mill design/ layout and feasibility; Procurement, storage, grinding and mixing of feed ingredients. Care and management of equipment used in feed processing and manufacturing. Types of storage structures for poultry feeds and raw materials handling. Preparation of premixes for different classes of poultry, Compound Animal Feedstuff Acts, Quality control of feed ingredients and compound feed.

Practicals:

Laboratory set up for physical, chemical and biological methods. Use of computer in feed industry, Preparation of premixes for various classes of poultry, Visit to feed mills, processing units and allied industries.

Suggested Readings

1. McNab, J. and K.N. Boorman. 2002. Poultry Feeds: Supply. Composition and Nutritive Value. CABI Publishing, Nosworthy Way, Oxfordshire, OX10 8DE, UK.
2. Schofield, E.K. 2005. Feed Manufacturing Technology V. American Feed Industry Association (AFIA) Inc. Arlington, USA.
3. <http://www.feedmachinery.com>

Path-505 Poultry Pathology

3(2-1)

Learning Objectives

After studying this course the students would be able to

- Knowledge about the different diseases of poultry.
- Conduct postmortem examination of poultry.
- Investigation of field outbreaks of disease of poultry.

Theory:

Introduction to poultry health problems in Pakistan. Pathological manifestations in viral, bacterial, parasitic and nutritional diseases. Mycosis and mycotoxicosis. Nutritional deficiency diseases. Environmental and management problems. Poisoning and intoxications.

Practicals:

Postmortem examination of poultry. Sample collection and laboratory tests for disease diagnosis. Investigation of field outbreaks of disease. Visits to poultry diagnostic laboratories.

Suggested Readings

1. Anjum, A.D. 1996. Poultry Diagnosis-Colored Atlas. Arbi Publications, Faisalabad, Pakistan.
2. Anjum, A.D. 1997. Poultry Diseases. 2nd Ed. Vet. Ag. Publications, Faisalabad, Pakistan.
3. Jordan, F.T.W., M. Pattison, D. Alexander, T. Fragher and D.J. Alexander. 2002. Poultry Diseases. 5th Ed. W.B. Saunders, London, UK.
4. Saif. Y.M., H.J. Barnes. J.R. Gison, A.M. Fadly, L.R. McDougald and D.E. Swaync. 2003. Diseases of Poultry. 11th Ed. Iowa State Press, Ames, Iowa, USA.

PS-609 Preparation of Research Project and Scientific Writing 2(1-1)

Learning Objectives:

During the course, Students will be able to:

- Learn about basics of Scientific writing
- Learn about Research project writing

Theory

Basics of Scientific writing, skills; Various written skills of Scientific paper, manuscript; How to write research project its basic parts; Reference writing for books, research papers and conferences; How to improve written skills and abilities; Consulting the relevant literature, Planning and essentials of research plan.

Practical

Training of the student in study and evaluation of problems of livestock industry and to find their solutions through research; Practical: Identification of research problem; Execution of project; Data collection, analysis, formulation of tables & figures and interpretation of results & discussion, conclusion, recommendations; Report writing, submission and presentation.

Suggested Reading:

1. Anonymous.1999.Instructions to Authors. Amer. Soc. Hort. Sci. Alexandria, Virginia.
2. Brown, B.W. 2009. Successful Technical Writing/Instructor's Guide,Goodheart-Willcox Publisher
3. Hardesty, R.E. 2010. Technical and Business Writing for Working Professionals, Xlibris Corporation, Bloomington, IN, USA.
4. Petersen, R.G. 1994. Agricultural Field Experiments–Design and Analysis. Marcel Dekker, Inc. New York, NY, USA.

CS-301 Computer Science and Information Technology 2(0-2)

Learning Objectives

After the completing the course, students will be able to:

- Know the different parts of computer.
- Know the different programs usually used in daily office routine.
- Use computer in professional life.

Theory:

Introduction of Computer, use of computer in different fields, software, hardware, Introduction to Windows and its different operations (Explanation of Start menu, Taskbar, Icons, Desktop control Panel, Window Explorer, My computer, Recycle bin, Introduction to Microsoft word processing and document handling: creating a document, composing educational documents, Introduction to Microsoft Excel (Home, Insert, Page layout, View), Microsoft Power point (Home, Insert, Page layout, view). Internet and its use in daily life, ISP, web browser, searching.

Suggested Readings

1. Mustafa T. and A.R. Sattar, 2010. Computer for beginners, KitabMarkez, Faisalabad.
2. Mahmood T. and I. Saeed, 2010. Computer Applications in busi
3. Saeed. I, A. Raza and T. Mahmood. 2011. The Concept of Information Technology, IT Series Publishers, Lahore, Pakistan.

4. Shelly, G.B and G.A. Wagoner. 2011. Using Computers: A gateway to Information. Boyd and Fraser Publishers, USA.