**POULTRY SCIENCE**  
Course Structure - at a Glance

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POULTRY SCIENCE
Course Contents

PSC 601  POULTRY BREEDING AND GENETICS  2+1

Objective
To impart knowledge on different systems of breeding, selection methods, design and implementation of breeding programme in developing egg-type and meat type birds. Modern tools in poultry breeding.

Theory

UNIT I

UNIT II
Systems of Breeding – Systems of Mating – Selection methods – Breeding programme for developing egg-type and Broiler type of birds – Developing hybrids - Other species of Poultry breeding and management - Formation and Management of inbred, pure lines, grand parent and parent stock.

UNIT III
Industrial breeding-Artificial insemination in chicken-Autosexing-Random SampleTest. Use of molecular genetics in poultry breeding-Quantitative trait loci and marker-assisted selection-Conservation of poultry genetic resources.

Practical
Breeds of poultry – Factors affecting inheritance of qualitative and quantitative traits in poultry - Constructing index and Osborne index-Estimating heritability – Breeding program for developing commercial hybrid layers, broilers, Japanese quail, duck, turkey, fancy birds, Guinea Fowl and Pigeons – Semen collection, evaluation & insemination in chicken & turkey – Breeding records –Use of computers to maintain breeding records and for selection.

Suggested Readings

PSC 602  POULTRY NUTRITION AND FEEDING  2+1

Objective
Teaching about nutrients & their functions, nutrient requirements of poultry and factors influencing the same. Imparting knowledge of different types of feeds and feeding methods.

Theory

UNIT I
Digestive system, digestion, metabolism and absorption of feed in poultry – Factors influencing the feed consumption in birds – Macro and micro-nutrients – Nutrient requirements for various species of poultry. Partitioning of energy -
Calorie: protein ratio – Nutrient interrelationships – Factors influencing the nutrient requirements.

UNIT II

UNIT III

UNIT IV

Practical

Suggested Readings

PSC 603 COMMERCIAL LAYER PRODUCTION

Objective
To impart knowledge on different systems of rearing commercial egg laying birds, care and management of commercial layers for optimal egg production.

Theory
UNIT I
farm equipments – Automation in poultry houses and its maintenance – Management of layers in different systems of rearing.

UNIT II
Deep litter & cage system of management – Medication and vaccination schedules & procedure for layers – Lighting programme for egg type birds - Water quality standards, watering of layer and water sanitation – Brooder, grower and layer management – All in All out and Multiple batch system of rearing layers.

UNIT III
Management of layers during peak egg production and maintaining the persistency in production – Factors causing uneven growth and low egg production - Monitoring egg production curve.

UNIT IV
Culling of unproductive birds – Record keeping – Biosecurity & health management – Management during different seasons – Induced moulting. - HACCP application for safe egg, value added egg production – Production of eggs free from harmful microbes, Mycotoxins & drug residues - Integration in layer production.

Practical
Layer farm lay out and blue print– Design of different chick, grower & layer houses, their specifications & blue print of deep litter and cage system – Selection & culling of layers, debeaking, dubbing, deworming, delicing, vaccination & other farm routines and operations – Farm sanitation, disinfection & waste disposal – Maintaining farm records – Visit to commercial layer farms – Record keeping – Calculating Hen day egg production, Hen housed egg production and other economic traits – Case study of production loss, reasons and corrective measures – Preparing project reports for layers under different batch systems – Calculating the cost of production of eggs.

Suggested Readings

PSC 604 COMMERCIAL BROILER PRODUCTION 2+1

Objective
To deal with different systems of rearing commercial broilers, manage mental practices for higher bodyweight with best feed efficiency in commercial broilers. Marketing of broilers efficiently.

Theory
UNIT I
Broiler Industry in India and the World – Systems of rearing broilers – Location, layout and design of Broiler houses – Broiler farm equipment.

UNIT II
Brooding and rearing of broilers- All in all out and multiple batch systems – Litter materials and deep litter management – Lighting for broilers – Environmentally controlled broiler houses & their management – Water quality and Watering of broiler and water sanitation- Management during different seasons.
UNIT III
Mash, crumble and pellet feeding of Broilers – weekly growth rate, feed conversion and livability in broilers- sex separate feeding – Feeding broilers for optimum growth rate & feed efficiency- Broiler performance indices – Broiler farm records.

UNIT IV

Practical
Location and blue print for a broiler farm – Broiler house design – Preparation of project report for broiler farm – Visit to broiler farms – Judging of live broilers and ready-to-cook broilers– Broiler vaccination, medication, brooding and transportation and farm routines. Record keeping - Calculating the cost of production of broilers – Feeding of broilers at different ages – Working out Feed efficiency – Case study on low body weights, reasons and corrective measures.

Suggested Readings

PSC 605     BREEDER STOCK, FLOCK HEALTH AND HATCHERY MANAGEMENT 3+1

Objective
To impart knowledge about care and management of breeders, hatchery operation, health management. And to study about common diseases and disorders of poultry, diagnosis, vaccination, prevention, control and treatment. Bio security measures in control of general & hatchery borne diseases.

Theory
UNIT I
History of Natural and Artificial incubation- embryo development-different breeder flocks – Planning a hatchery, breeder farm – Special care of breeder flock –Collection, selection and care of hatching eggs – Breeder male and female management – Flock testing & culling - Farm and hatchery equipments – Incubation practices – Ventilation and temperature control – Hatchery Management, Fumigation and sanitation – Breeder farm and hatchery operations, routine & schedule - Factors affecting fertility and hatchability.

UNIT II
Care of day old chicks and their vaccination - Restricted & controlled feeding of breeders – Sex separate feeding and nutrient supplementation. – Seasonal management of breeders – Location of hatchery – Layout and design of breeder houses, hatchery & other buildings.

UNIT III
Biosecurity, health management and waste disposal – Vaccination & medication schedule for breeders. Control of vertically transmissible & hatchery borne diseases.
UNIT IV

UNIT V
Hatching egg & SPF egg import and export regulations – Maintaining Salmonella and Mycoplasma free breeding flock –Application of HACCP and Good Management Practices (GMP) in hatchery management for better chick quality.

Practical
Breeder farms and hatchery records, selection, fumigation, care and storage of hatching eggs. Layout and blue prints for breeder farm and hatchery –Incubation requirements –Incubator management – Hatchery sanitation & fumigation procedures – Pedigree hatching – Hatchery waste disposal and recycling – Calculating cost of production of hatching eggs and day-old-chicks – Attending breeder farm routines & operation – Flock testing & culling of reactors – Analyzing hatchability results and hatchery records-Economics of layer and broiler hatchery.

Suggested Readings

PSC 606 MANAGEMENT OF POULTRY OTHER THAN CHICKEN  2+1

Objective
Care and management of different breeds, varieties of poultry other than chicken, methods of rearing and common diseases affecting them and their control measure.

Theory
UNIT I
Breeds and varieties of Turkey, Duck, Goose, Pigeon, Guinea fowl, Budgerigar, Japanese quail, Emu and Ostrich – Incubation periods & incubation procedure for different species – Housing, cage & equipments for different species – Duck, Turkey, Japanese Quail, Guinea fowl, Emu, Ostrich production and rearing under different systems.

UNIT II
Management and rearing of Turkey, duck, goose, Guinea fowl, Japanese quail, pigeon, emu and ostrich- Feeding standards and feeding, watering and rearing
systems and procedure for different species of poultry - Breeding policies of egg and meat production in different species – Preparation of Project reports for different species for commercial exploitation.

UNIT III
Common diseases affecting poultry other than chicken and their control – Regulations for import and export of different species of poultry – prevention of exotic diseases through import of poultry products and live birds.

Practical
Layout and design of housing & cages for other species of poultry. Visit to commercial Japanese quail, turkey and duck farms. Incubation and care of hatching eggs and young ones – Rearing practices followed by duck, quails and turkey farmers under field conditions. Preparing project reports for different species and calculating the cost of production.

Suggested Readings
PSC 608  
POULTRY ECONOMICS, PROJECTS AND MARKETING  2+1

Objective
To study about measures of performance efficiency in poultry farms and its allied sector, components of project reports and preparation of viable projects related to poultry industry.

Theory
UNIT I
Glossary of terms used in poultry economics & projects – Measures of performance efficiency in broiler, layer, breeder and other poultry species, hatcheries and other poultry related operations – Production standards and goals.

UNIT II
Planning poultry enterprise –Bank norms for poultry projects – Poultry insurance – Methods to improve the production efficiency and reduce the production cost - Components of project reports and preparing projects.

UNIT III
Integration in Poultry production – Marketing channels for eggs and meat – Integration in marketing of eggs and meat - Cost of production of egg, broiler, hatching egg, day-old chick, compounded feed - Effect of new economic policies on poultry industry – Viability of poultry projects.

Practical
Preparing different poultry projects for bank finance – Calculating the cost of production of various products under various systems-case study – Preparation of Balance sheet, break even points, benefit: cost ratio & other farm economic indices - Preparation of feasibility & viability reports.

Suggested Readings

PSC 609  
PHYSIOLOGY OF POULTRY PRODUCTION  2+1

Objective
To study the basic principles of physiology of poultry production in relation to egg formation, production, incubation, stress and role of environment.

Theory
UNIT I
Skeletal system of poultry – Comb pattern, plumage - Physiology of poultry digestive system- Digestion, metabolism and absorption of feed and water – Role of enzymes – Poultry circulatory system – Respiratory system – Physiology of growth- muscle growth-bone growth and growth of body parts-Types of muscle fibre and functions.

UNIT II
Poultry nervous system and its function – Excretory system – Male and female reproductive system-Reproductive tract-Semen production-semen characteristics-

UNIT III
Neuro-endocrine control of egg production-Ovulation and Oviposition – Clutch and Pause.

Practical

Suggested Readings

PSC 701  APPLIED POULTRY NUTRITION  2+1

Objective
Teaching about nutrients and their functions, nutrient requirements of poultry and factors influencing the same. Different methods and forms of feeds and feeding of poultry.

Theory
UNIT I
Developments in the nutrient requirement for egg and meat-type chicken - Concepts in various poultry feeding procedures and methods for optimal production - Factors influencing the nutrient requirements, feed intake and feed efficiency in poultry-Problems encountered in nutritional deficiencies - Protein and energy utilization and calorie protein ratio, Vitamins, minerals and their interactions in poultry rations.

UNIT II
In Ovo -Juvenile nutrition for optimal growth rate and feed efficiency – Care in grower feeding - Nutrition and feeding of layers /breeders during peak egg production- Nutritional requirements for higher egg production, broiler meat production, higher fertility and hatchability and other special purposes.

UNIT III

UNIT IV
HACCP implementation in feed quality control – Production of drug, Mycotoxins and pesticide residue free feeds.

Practical
Computing of specialty and functional feeds – Estimation of available carbohydrate, Aflatoxin, tannins, hydro cyanic acid and other toxins in the feed. Evaluation of various feeds for its quality – Field methods of feed quality control

**Suggested Readings**


Selected articles from journals.

**PSC 702 CONCEPTS IN COMMERCIAL POULTRY PRODUCTION 2+1**

**Objective**

To impart knowledge on different systems of poultry rearing, care and management of commercial layers/broilers for optimal egg and meat production.

**Theory**

UNIT I

Global trends in poultry production - Advances in broiler production in India – concepts in egg production – Latest concepts in breeder management – advances in hatchery operations for higher hatchability & chick quality.

UNIT II

Optimal microclimatic condition in poultry houses and cages for higher production – Management of poultry in environmentally controlled houses – Management of poultry under adverse climatic conditions – advances in the management of other species of poultry - Behaviour patterns of poultry in different growing systems.

UNIT III

Advanced management techniques for egg and meat production - advances in lighting management, feeding management, litter management and manure management.

UNIT IV

The role of integration in poultry production – Factors influencing egg production in different species of poultry – Factors influencing growth rate and egg production - Automation in poultry production.

UNIT V

Regulations for cage-free egg production and organic chicken production – Functional feeds for functional foods – Production of HACCP and GMP certified table eggs, meat, chicks, hatching eggs and other value added products for export.

**Practical**

Performance study in commercial layer, broiler, Japanese quail, duck, turkey and other species of poultry farms by Interpretation of the farm records - Managemental routines of different species of poultry - calculating the cost of production –Estimation of microclimatic condition and comparing the productive traits– Modern poultry house and cage design for optimal efficiency and cost reduction.

**Suggested Readings**

Selected articles from journals.
PSC 703  DEVELOPMENTS IN POULTRY PRODUCTS TECHNOLOGY  2+1

Objective
Composition and nutritive value of eggs and chicken meat, grading, packaging and preservation methods of eggs and meat, functional and value added poultry products, marketing of eggs and poultry meat.

Theory
UNIT I
Global trends in poultry and egg processing - Indian scenario of poultry processing industry - Nutrients & Non-nutrient components in regular and value added poultry products – various measures of egg and meat quality control – advances in value addition to poultry products.

UNIT II
Concepts in poultry meat and egg preservation – Newer concepts in meat tenderization, canning, dehydration, curing, irradiation, etc. - Modified atmosphere packaging – Other processed products - Room temperature preservation of poultry fast foods by multi hurdle technology.

UNIT III

UNIT IV
Improving the product quality to meet Codex & European standards – Standards for egg, meat and their products -Production of immunoglobulins, lecithin, lysozyme, sialic acid and other pharmaceutical products from eggs – Sanitary & phytosanitary measures for food safety.

Practical

Suggested Readings
Selected articles from journals.

PSC 704  EMERGING DISEASES OF POULTRY AND FLOCK HEALTH  2+1

Objective
To study about common diseases and disorders of poultry, their diagnosis, vaccination, prevention & treatment, emphasis on control of emerging poultry diseases of zoonotic importance, disease diagnostic techniques.

Theory
UNIT I
The concepts of disease prevention in poultry – Emerging and reemerging avian diseases -Factors influencing immuno suppression and stimulation – Developing immunity in poultry
UNIT II
Water sanitation, hatchery sanitation procedures - Control of vertically transmissible diseases – non-infectious and metabolic diseases in poultry and their control – Bio security – Mycotoxins and their control.

UNIT III

UNIT IV
Flock management for Specific pathogen free egg production – Maintaining the HACCP standards in poultry farms – developments in the Exim policies for flock health.

Practical

Suggested Readings
Selected articles from journals.

PSC 705 ADVANCED POULTRY BREEDING METHODS 2+1

Objective
To impart knowledge about different systems of breeding, selection methods and implementation of breeding programme in developing egg-type and broiler hybrids. Modern tools in poultry breeding.

Theory
UNIT I

UNIT II
Modern methods in commercial layer and broiler breeding, performance testing – Pure line breeding – Inbreeding and hybridization - Diallele mating, lethal and semi lethals in poultry. Pedigree hatching. Genotype versus environmental interaction.

UNIT III
Practical
Construction of selection index – Analysis of breeding data collected from breeding records – Problem in qualitative and quantitative inheritance - Estimation of heritability and standard error of heritability by different methods – analysis of heritability for different traits – Estimation of inbreeding coefficient – Artificial insemination in poultry.

Suggested Readings
Muir WM & Aggrey SE. 2003. Poultry Genetics and Biotechnology. CABI. Selected articles from journals.

PSC 706  POULTRY ECONOMICS, MARKETING AND INTEGRATION  2+1

Objective
To study about measures of performance efficiency in poultry farms and its allied sectors, hatcheries and developing poultry projects.

Theory
UNIT I

UNIT II

UNIT III
Future trends in broiler and egg production –factors influencing the profit margin in poultry enterprises.

Practical
Study of marketing channels of egg and meat, calculating cost of production of eggs, meat, day-old chick, feed and processing plants– preparing other related poultry projects.

Suggested Readings
POULTRY SCIENCE
List of Journals

- Avian Diseases
- Avian Pathology
- Avian Research
- British Poultry Science
- Indian Journal of Poultry Science
- International Poultry Production
- Japanese Poultry Science
- Journal of Applied Poultry Research
- Journal of Avian Biology
- Poultry Abstract
- Poultry Science
- World Poultry Science Channel
- Tamilnadu Journal of Veterinary and Animal Sciences
- Indian Journal of Veterinary and Animal Sciences

e-Resources

- http://www.alabamapoultry.org
- http://www.eggcom.com
- http://www.dpicken.com
- http://www.georgiaeggs.org
- http://www.anasc.purdue.edu/ISEB
- http://www.ag.anasc.purdue.edu/ISP
- http://www.MinnesotaTurkey.com
- http://www.nebraskapoultry.org
- http://www.ohiopoultry.org
- http://www.aeb.org
- http://www.afia.org
- http://www.albcsa.org
- http://www.amerpoultryassn.com
- http://www.avianresearch.co.uk
- http://www.canr.uconn.edu/ansci/
- http://www.anasc.cornell.edu
- http://www.castscience.org
- http://www.enline.org
- http://www.internationalegg.com
- http://www.eatchicken.com
- http://www.nmaonline.org
- http://www.eatturkey.com
- http://www.naga.org
- http://www.mtgplace.com
- http://www.poultryscience.org
- http://www.posc.tamu.edu/library/dother.html
- http://www.poultryegg.org
- http://www.usapeec.org
- http://www.wattpoultry.com
- http://www.afns.ualberta.ca
- http://www.poultryresearchcentre.ch
- http://www.poultryscience.uark.edu/poulty.html
- http://www.aes.ucdavis.edu
- http://animalscience.ucdavis.edu
- http://animalscience.ucdavis.edu/extension
- http://www.calstate.edu
- http://www.csupomona.edu
- http://www.animalscience.calpoly.edu
- http://www.clemson.edu/avs/
Suggested Broad Topics for Master’s and Doctoral Research

- Breeding programs for different species of poultry to improve the economic traits.
- Utilization of conventional and unconventional feeds in poultry rations.
- Study on exogenous enzymes, probiotics for increasing the feed efficiency in poultry.
- Evolving ways and means for the improving the performance of commercial, broilers and layers for higher economic gains.
- Micro and trace minerals requirements study for broiler and layers.
- Designing and development of eco friendly and environmentally controlled houses for large commercial poultry farms.
- Standardizing the disinfections procedures for sustainable poultry production.
- Standardizing the sanitary and phyto sanitary measures for safe production of eggs and broilers.
- Prevention and control of toxin, pesticides and antibiotic residues in egg and meat.
- Value added egg and poultry meat products program
- Development of fast foods by utilizing poultry egg and meat.
- Development and standardization of designer eggs and low fat high protein poultry meat.
- Preservation, storage, packaging of value added egg and meat products and their standardization.
- Reduction of pollution from poultry farms and processing plants.
- Profitable utilization of Poultry waste and manure.
- Development and standardization of organic poultry farming and standards for phyto sanitary measures.
- Standardization of managerial, nutritional methods and schedules for rearing turkeys, guinea fowls, geese, Japanese quails and domesticated ratites.
- Development of suitable varieties of turkeys and guinea fowl suitable for different agro climatic conditions.
- Development of suitable birds for backyard poultry.
- Poultry bio security measures in organized farms.
- Studies on diseases affecting turkeys, guinea fowl, Japanese quail and their preventive measures.
- Disease surveillance, forecasting and development of field level diagnostic kits.