



Restructured Lecture Schedule of courses for PhD in Poultry Science

Maharashtra Animal and Fishery Sciences University, Nagpur

Title: Applied Poultry Nutrition (Theory classes-34)	
Course No: PSC -701 Credits :2+1=3	
S. N.	Topics to be covered in the lectures
1.	Developments in nutrient requirements for egg type chicken
2.	Developments in nutrient requirements for meat type chicken
3.	Concepts in various poultry feeding procedures
4.	Methods of feeding for optimal production
5.	Factors influencing nutrient requirements in poultry
6.	Factors influencing the feed intake in poultry
7.	Factors influencing the feed efficiency in poultry
8.	Nutritional deficiencies
9.	Protein and energy utilization
10.	Digestibility of nutrients
11.	Ileal digestibility of amino acids
12.	Vitamin, minerals and their interactions in poultry ration
13.	In ovo nutrition for optimal growth rate and feed efficiency
14.	Juvenile nutrition for optimal growth rate and feed efficiency
15.	Care in grower and pre-layer feeding
16.	Nutrition and feeding of layers during peak egg production
17.	Nutrition and feeding of breeders during peak egg production
18.	Nutritional requirements for higher egg production
19.	Nutritional requirements for broiler meat production
20.	Nutritional requirements for fertility and hatchability
21.	Nutritional requirements for special purposes
22.	Feeding of broilers for uniform growth ., Feeding of broilers for feed efficiency
23.	Feeding to enhance egg quality and nutrients
24.	Nutritive feed additives in feed production
25.	Non-nutritive feed additives in feed production
26.	Organic feed ., Functional and designer feed
27.	Advances in feed milling technology
28.	Specialty feed production to produce microbial safe foods
29.	Specialty feed production to produce SPF eggs
30.	Specialty feed production to produce organic foods
31.	HACCP implementation in feed quality control
32.	Production of feed free from antibiotics, mycotoxins and pesticide residues
Title: Applied Poultry Nutrition	

(Practical classes-17)	
Course No: PSC -701	
Credits :2+1=3	
S. N.	Topics to be covered in the practical's
1.	Computation of specific foods
2.	Computation of functional foods
3.	Estimation of available carbohydrate/ metabolizable energy in feed
4.	Estimation of Aflatoxin in feed
5.	Estimation of anti-nutritional factors- tannins in feed
6.	Estimation anti-nutritional factors- hydrocyanic acid in feed
7.	Estimation of other toxins in feed
8.	Evaluation of various feeds for its quality
9.	Field methods of feed quality control
10.	Feed microscopy
11.	Estimation of carotenes
12.	Estimation of cholesterol
13.	Estimation of peroxides
14.	Quality control of functional poultry feeds
15.	Maintaining feed quality from production to consumption
16.	Near Infra-red technology of feed evaluation
17.	Other advanced technologies of feed evaluation

Course Title: Recent Trends in Commercial Poultry Production (Theory classes-32)	
Course Code: PSC- 702 Credit Hours: 2+1	
Sr. No.	Title of lecture
1	Global trends in poultry production –
2	Advances in broiler production in India –
3	Concepts in egg production –
4	Latest concepts in breeder management – broiler
5	Latest concepts in breeder management - layer
6	Advances in hatchery operations for higher hatchability and chick quality –
7	Use of artificial intelligence in poultry production.
8	Optimal microclimatic condition in poultry houses and cages for higher production
9	Management of poultry in environmentally controlled houses –
10	Management of poultry under adverse climatic conditions –
11	Advances in the management of other species of poultry – J. quail and Duck
12	Advances in the management of other species of poultry – Turkey and Emu/ ostrich
13	Behavioural patterns of poultry in different growing systems.
14	Advanced management techniques for egg production
15	Advanced management techniques for meat production
16	Advances in lighting management,
17	Advances in feeding management,
18	Litter management
19	Manure management.
20	Factors influencing egg production in different species of poultry –
21	Factors influencing growth rate and egg production –
22	Automation in poultry production - broilers and layers
23	Regulations for cage-free egg production
24	organic chicken production –
25	Functional feeds for functional foods –
26	Production of HACCP, GMP certified table eggs,
27	Meat, chicks, hatching eggs and other value-added products for export.
28	Advances in Biosecurity,
29	Advances in welfare
30	Advances in waste management –
31	Role of integration in poultry production - broilers
32	Role of integration in poultry production- layers

Title: Applied Poultry Nutrition
(Practical classes-17)

Course Code: PSC- 702 (2+1)

Sr. No.	Topics to be covered in practical's
1	Performance study in the commercial layer farms by Interpretation of the farm records
2	Performance study in the commercial broiler, farms by Interpretation of the farm records
3	Performance study in the commercial Japanese quail, farms by Interpretation of the farm records
4	Performance study in the commercial duck, farms by Interpretation of the farm records
5	Performance study in the commercial, turkey farms by Interpretation of the farm records
6	Management routines of different species of poultry – broiler
7	Management routines of different species of poultry – layer
8	Management routines of different species of poultry – Japanese quail, duck and turkey
9	Calculating the cost of production – layer,
10	Calculating the cost of production –broiler,
11	Calculating the cost of production – Japanese quail,
12	Calculating the cost of production – duck and turkey
13	Estimation of microclimatic conditions and comparing the productive traits–
14	Modern poultry house design for optimal efficiency and cost reduction.
15	Modern poultry cage design for optimal efficiency and cost reduction
16	Field visit

Course Title: Developments in Poultry Processing and Products Technology
(Theory classes-34)

Course Code: PSC- 703(2+1)

Sr.No.	Topics to be covered in the lectures
1.	Global trends in egg and poultry processing
2.	Indian scenario of poultry processing industry
3.	Structure, composition and nutritive value of eggs, factors affecting egg quality
4.	Structure, composition and nutritive value of chicken meat, factors affecting chicken meat quality
5.	Nutrients and Non-nutrient components in regular and value-added poultry products
6.	Various measures of egg quality control
7.	Various measures of meat quality control
8.	Advances in value addition to poultry egg products
9.	Advances in value addition to poultry meat products
10.	Concepts in preservation of egg
11.	Concepts in preservation of poultry meat
12.	Newer concepts in meat canning and dehydration
13.	Newer concepts in meat curing and irradiation
14.	Tenderization of meat, methods of tenderization, factors affecting tenderness, methods of measuring tenderness
15.	Eating quality and sensory evaluation of meat
16.	Different packaging methods of egg and chicken meat
17.	Modified atmosphere packaging
18.	Other processed products
19.	Room temperature preservation of poultry fast foods by multi hurdle technology

20.	Further processing to produce ready to eat egg products
21.	Further processing to produce ready to eat meat products
22.	Production of Egg powder (whole egg powder, albumen powder, yolk powder)
23.	Desugarization and pasteurization of eggs
24.	Functional properties of eggs., Industrial uses of eggs
25.	Marketing trends in poultry meat and eggs
26.	Improving the product quality to meet CODEX and European standards
27.	Codex and European standards for the egg and their products
28.	Codex and European standards for meat and their products
29.	Production of immunoglobulin., Production of lecithin
30.	Production of lysozyme
31.	Production of sialic acid and other pharmaceutical products from eggs
32.	Sanitary and phytosanitary measures for food safety

Course Code: PSC- 703(2+1)

practical class-17

Sr.No.	Topics to be covered in the practical's
1.	Preparation of value added products suitable for preservation at room temperature
2.	Preparation of Barbecue
3.	Preparation of Tandoori
4.	Preparation of local specific poultry meat products- Meat balls, meat patties, etc.
5.	Preparation of local specific poultry egg products
6.	Grading of eggs
7.	Grading of meat
8.	Estimation of egg quality
9.	Estimation of meat quality
10.	Preservation of egg
11.	Preservation of meat
12.	Testing drug residues in poultry products
13.	Testing pesticide residues in poultry products
14.	Testing mycotoxins in poultry products
15.	Testing antibiotic residues in poultry products
16.	Measurement of the microbial quality of poultry foods.
17.	Export of meat products from our country, prospects and challenges

Course Title: Emerging and re-emerging diseases of poultry and Health management (Theory-32)

Course Code: PSC- 704 Credit Hours: 2+1

Sr.No	Topics to be covered in the lectures
1.	Concepts of disease prevention in poultry
2.	Emerging and re-emerging avian diseases
3.	Factors influencing immune suppression/ immunity
4.	Enhancing immunity in poultry.
5.	Diseases and health management in pet birds
6.	Exotic diseases of domesticated and pet birds
7	Water sanitation
8	Hatchery sanitation procedures
9	Control of vertically transmissible diseases,
10	Hatchery borne diseases
11	Control of vertically transmissible diseases
12	Non-infectious diseases in poultry and their control
13	Metabolic diseases in poultry and their control
14	Parasitic diseases in poultry and their control
15	Mycotoxins and their control.
16	Poultry diseases of zoonotic importance
17	Stress alleviation
18	Prevention and control of bacterial in poultry
19	Prevention and control of viral diseases in poultry
20	Biosecurity measures to prevent bacterial and viral diseases
21	Control measures of problematic re-emerging diseases of poultry like Ranikhet and Marek's.
22	Control measures of problematic re-emerging Avian influenza disease of poultry
23	Control measures of problematic re-emerging diseases of poultry like Infectious bursal disease and Infectious Bronchitis
24	Control measures of problematic re-emerging disease of poultry like Infectious laryngotracheitis
25	Monitoring of flock health – Salmonella, Mycoplasma and Avian leucosis and Other viral and bacterial diseases of poultry
26	Antibiotic resistance
27	Latest vaccines and vaccinology in poultry production
28	Flock management for specific pathogen free egg production
29	Maintaining the HACCP standards in poultry farms and

	Developments in the EXIM policies for flock health
30	Concept of compartmentalization and zoning as per terrestrial code
31	Geographical information system in disease control.
32	Role of wild and aquatic birds in transmission of diseases to domesticated poultry

Course Title: Emerging and re-emerging diseases of poultry and Health management (Practical Classes-16)	
Course Code: PSC- 704 Credit Hours: 2+1	
Sr.No.	Topics to be covered in the Practical
1.	Studying the Immune status of birds
2.	Egg inoculation techniques in laboratory diagnosis
3.	Differential diagnosis of various poultry diseases by post-mortem
4.	Differential diagnosis of various poultry diseases by laboratory techniques
5.	Molecular diagnosis of diseases
6.	Antibiotic sensitivity test
7.	Designing Vaccination schedule for different poultry species
8.	Disinfection and sanitation
9.	Ectoparasite control
10.	Medication procedures.
11.	Ha and Hi testing
12.	Monitoring of antibody response – RD
13.	Mareks disease and IBD
14.	Collection, preservation and dispatch of material for poultry diseases
15.	Bacterial isolation and identification
16.	General procedures for diagnosis of viral diseases

Course Title: Applied Poultry Breeding (Theory-16)	
Course Code: PSC- 705 Credit Hours: 1+1	
Lecture No.	Topics to be covered in the Lecture
1.	Gene and genotypic frequency
2.	Sex-linked, limited and influenced traits-Autosexing
3.	Qualitative and quantitative traits and its inheritance in poultry
4.	Methods of selection – family selection – selection for multi characteristics and construction of selection indices
5.	Reciprocal recurrent selection – Recurrent selection, Marker assisted selection
6.	Random bred control populations - Selection limit - Osborne's Index, construction of selection index for multiple traits
7.	Use of molecular genetics in poultry breeding
8.	Exploitation of additive and non-additive gene action for commercial poultry production
9.	Heterosis – Exploitation of hybrid vigour for commercial production of layers and broilers
10.	Formation of synthetic lines and development of strains in poultry
11.	Comparative efficiency of different selection methods in poultry
12.	Modern methods in commercial layer and broiler breeding
13.	Performance testing –Pure line-breeding
14.	Inbreeding and hybridization - Diallele mating
15.	Pedigree hatching
16.	Genotype × Environment interaction

Course Title: Applied Poultry Breeding (practical's - 16)	
Course Code: PSC- 705 ., Credit Hours: 1+1	
Practical No.	Topics to be covered in practical's
1.	Construction of selection index
2.	Construction of selection index
3.	Analysis of breeding data collected from breeding records
4.	Analysis of breeding data collected from breeding records
5.	Estimation of qualitative inheritance
6.	Estimation of quantitative inheritance
7.	Estimation of variance
8.	Heritability and standard error of heritability by different methods
9.	Heritability and standard error of heritability by different methods
10.	Repeatability
11.	Analysis of heritability for different traits
12.	Analysis of heritability for different traits
13.	Estimation of inbreeding coefficient
14.	Estimation of inbreeding coefficient
15.	Artificial insemination in poultry
16.	Artificial insemination in poultry

Course Title: Poultry Economics, Marketing and Integration (Theory Classes -32)	
Course Code: PSC- 706 Credit Hours: 2+1	
Lecture No.	Topics to be covered in the lectures
1	Present practices and future trends in the production of egg
2	Present practices and future trends in the production of poultry meat
3	Present trends in consumption
4	Demand and supply
5	Seasonal variations in production and consumption
6	Marketing channels
7	Procedures of marketing for eggs and meat
8	Market intelligence
9	Advertising of poultry products
10	Branding of poultry products
11	Developments of egg sales outlets
12	Various poultry enterprises
13	Choice of production size of business
14	Input and output analysis
15	Calculating cost of various inputs
16	Calculating cost of production
17	Break-even point analysis
18	Price determination
19	Role of NECC in egg marketing
20	Role of BroMark and other marketing agencies
21	Least demand and supply indices of performance
22	Performance targets and achievements
23	Poultry Marketing management
24	Poultry Business management
25	Market managerial skills and Human resource development
26	Basic terms used in poultry marketing and project reports
27	Cost and financial management
28	Future trends in broiler production
29	Future trends in egg production
30	Factors influencing the profit margin in poultry enterprises
31	Role of integration in Poultry business
32	Different types of integration

Course Title: Poultry Economics, Marketing and Integration (Practical Classes -16)	
Course Code: PSC- 706 Credit Hours: 2+1	
Practical No	Title of Practical
1	Study of marketing channels of egg and meat
2	Calculating the cost of production of egg
3	Calculating the cost of production of broiler
4	Calculating the cost of production of day-old chick
5	Calculating the cost of production of feed
6	Calculating marketing costs
7	Technical aspects of project report
8	Financial Aspects of Project report
9	Techno economic parameters of commercial broilers
10	Techno economic parameters of commercial layers
11	Techno economic parameters of breeders
12	Project report for broilers
13	Project report for layers and Project report for quails
14	Contract broiler farming
15	Use of social media in popularizing poultry and poultry products
16	Study of successful business models in the poultry sector

Course Title: Diversified Poultry Production
(Theory classes -32)

Course Code: PSC- 707., Credit Hours: (2+1)

Sr. No.	Topics to be covered in the lectures
1.	Commercial hybrid strains of ducks for egg and meat production
2.	Feeding and management
3.	Nutrient requirement of duck (broiler and layer)
4.	Housing-Different systems of rearing, floor space requirement
5.	Specific diseases of ducks, prevention and their control
6.	Slaughter and processing of ducks
7.	Nutritive value of duck meat and egg
8.	Indigenous duck production system including polythene duck pond
9.	Economics of production of ducks
10.	Varieties of Japanese quail for meat and egg production
11.	Cage and deep litter system of rearing of quails
12.	Feeding and management
13.	Nutrient requirement of Japanese quail (broiler and layer)
14.	Housing-Different systems of rearing, floor space requirement
15.	Emerging diseases affecting Japanese quail
16.	Economics of production of Japanese quail
17.	Varieties/ breeds of Turkey
18.	Varieties/ breeds of Guinea fowl and Geese,
19.	Varieties/ breeds of Emu and Ostriches
20.	Feeding and management
21.	Nutrient requirement of turkey (broiler and layer), Guinea fowl, Geese, Emu and Ostriches
22.	Housing-Different systems of rearing, floor space requirement
23.	Emerging diseases and their prevention
24.	Nutritive value of Turkey, Geese and Guinea fowl
25.	By-products of Geese, Emu and Ostriches
26.	Importance of Japanese quail, ducks, turkey, geese, guinea fowl, emu and ostrich farming
27.	Incubation periods and incubation procedure for different species of poultry
28.	Fumigation and sanitation
29.	Scope and constraints in the marketing of diversified poultry products
30.	Rearing and management of common pet birds and other birds of regional importance
31.	Common diseases affecting pet birds and their prevention and treatment

32.	Economics of production of different pet birds
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Course Title: Diversified Poultry Production	
Practical classes -16)	
Course Code: PSC- 707., Credit Hours: (2+1)	
Sr.No.	Topics to be covered in the practical's
1.	Layout and design of housing for other species of poultry
2.	Visit to commercial Japanese quail farms
3.	Visit to commercial turkey farms
4.	Visit to commercial duck farms
5.	Incubation and care of hatching eggs and young ones
6.	Rearing practices followed for duck, quails and turkey farmers under field conditions
7.	Nutrient requirement of Japanese quail (broiler and layer)
8.	Nutrient requirement of turkey (broiler and layer)
9.	Nutrient requirement of duck (broiler and layer)
10.	Designing of aviaries for pet birds
11.	Different types of feed prepared for pet birds
12.	Vaccination and medication for diversified poultry species
13.	Preparing project report for turkey and calculating the cost of production
14.	Preparing project report for Japanese quail and calculating the cost of production
15.	Preparing project report for duck and calculating the cost of production
16.	Preparing project report for guinea fowl and calculating the cost of production