PG COURSE SYNOPSIS/LECTURE SHEDULE OF ANIMAL NUTRITION

ANN-601 - ANIMAL NUTRITION – ENERGY AND PROTEIN (3+0)

A. Theory

SN	Units	topic of course	Instructor Name	No. of classes
1	Unit-1	Basic terminology and classification of carbohydrates, fats and proteins. Fundamental concepts of Digestion and metabolism of Carbohydrate Fat and Protein in different species of animals. Gluconeogenesis, Recent advances in glucogenic precursors on acetate utilization. NPN metabolism, urea fermentation potential and metabolizable protein. Amino acids imbalance, antagonism and toxicity.	Dr. Chandramoni	15
2	Unit-2	Measures of feed energy. Partitioning of feed energy. Efficiency of energy and Protein utilization. Feeding standards- comparative appraisal and limitations.	Dr. Chandramoni	10
3	Unit-3	Rumen degradable Protein (RDP), and rumen undegradable protein (UDN) and Kinetics. Energetics of protein synthesis and turn over. Quantification of microbial protein synthesis. Protein quality determination in monogastrics and utility.	Dr. Chandramoni	12
4	Unit-4	Energy balance, Fasting catabolism. Direct and indirect calorimetry. Determination of energy and protein requirements. Energy and protein requirement for maintenance, growth, pregnancy and lactation in ruminants, companion animals and poultry.	Dr. Chandramoni	13

Reference Books:

1. Principles of Animal Nutrition and Feed Technology by D.V. Reddy
2. Applied Nutrition (Livestock, Poultry and Lab. Animal etc.) by D.V. Reddy
3. Animal Nutrition in the Tropics by S.K. Ranjhan
4. Animal Nutrition and Feeding Practices by S.K. Ranjhan
5. Feeds and Principles of Animal Nutrition by G.C. Banerjee
6. Animal Nutrition by L.A. Maynard & J.K. Loosli
7. Animal Nutrition by P. McDonald
8. Laboratory manual developed by Department of Animal Nutrition, BVC, Patna

PG COURSE SYNOPSIS/LECTURE SHEDULE OF ANIMAL NUTRITION

ANN-602 - ANIMAL NUTRITION – MINERALS, VITAMINS AND FEED ADDITIVES (3+1)

A. Theory

SN	Units	topic of course	Instructor Name	No. of classes
1	Unit-1	Essential minerals, general role of minerals, soil-plant-animal-human relationship, requirement of minerals, factors affecting requirements. Macro elements and micro elements, their distribution, metabolism, physiological functions, deficiencies and excesses, requirements and sources. Probable essential minerals. Toxic minerals. Definition, history, classification, chemistry, functions, deficiencies and excesses, requirements and sources of water soluble and fat-soluble vitamins.	Dr. Sanjay Kumar	30
2	Unit-2	Critical minerals for ruminants and non-ruminants, chelates and chelated minerals. Inter-relationship of minerals with other nutrients. Impact of minerals arising from industrial affluent on animal health and production. Critical limits of minerals in edible herbages. Bioavailability studies in minerals. Impact of minerals on reproduction. Area specific minerals.	Dr. Sanjay Kumar	12
3	Unit-3	Relationship of vitamins with other nutrients. Critical vitamins for ruminants and non-ruminants. Feed additives including probiotics Prebiotics, Symbiotics and feed enzymes. Research techniques in nutrition.	Dr. Sanjay Kumar	10
B.		**PRACTICAL**		
4	Unit-1	General principles of mineral estimation, Sampling and processing techniques, Estimation of macro- and micro-minerals. Determination of bioavailability of minerals. Formulation of mineral mixture for various species. Identification of adulterants and quality control. Atomic absorption spectrometry in mineral estimation. Preparation of diets for mineral studies.Principles of vitamin estimation. Estimation of some important vitamins (vitamin A,E,C). Formulation of vitamin mixture for various species.	Dr. Sanjay Kumar	18

Reference Books:

1. Principles of Animal Nutrition and Feed Technology by D.V. Reddy
2. Applied Nutrition (Livestock, Poultry and Lab. Animal etc.) by D.V. Reddy
3. Animal Nutrition in the Tropics by S.K. Ranjhan
4. Animal Nutrition and Feeding Practices by S.K. Ranjhan
5. Feeds and Principles of Animal Nutrition by G.C. Banerjee
6. Animal Nutrition by L.A. Maynard & J.K. Loosli
7. Animal Nutrition by P. McDonald
8. Laboratory manual developed by Department of Animal Nutrition, BVC, Patna

PG COURSE SYNOPSIS/LECTURE SHEDULE OF ANIMAL NUTRITION

ANN-603 - FEED TECHNOLOGY (1+1)

A. Theory

SN	Units	topic of course	Instructor Name	No. of classes
1	Unit-1	Importance of feed technology in relation to animal productivity. The integrated biological, chemical and physical basis for evaluating the inherent nutritional quality of feed ingredients and feeds. Familiarization of various feed mill equipments, layout and operations. Problems of feed manufacturing units and control measures. Quarantine measures.	Dr. Pankaj kumar singh	08
2	Unit-2	Introduction to the formula feed manufacturing including principles of material handling, grinding, mixing, pelleting and other major processing operations. Crumbling, Flaking, Popping, Extrusion. Principles of instrumentation and analysis, with emphasis on application to quality control and research in the feed industry.	Dr. Pankaj kumar singh	08
3	Unit-3	The formulation of concentrate mixtures, premixes and rations using computer. Automated feed mill. Personal management in feed plants, laws and regulation of feed manufacturing industry. Codex alimentarius, HACCP. Organizational charts for small, medium and large feed plants, labour standard, planning and production programme, handling of plant equipment. Merits and demerits of automated feed plant.	Dr. Pankaj kumar singh	06
B.		**PRACTICAL**		
4	Unit-1	Identification of feed ingredients and their specifications, as well as compound feed for different categories of livestock and poultry. Feed microscopy. Formulating premixes. Introduction to Pulverisers, pelletisers, complete feed blocks equipment's Plant layout and design of different capacity of feed mills, problems related to feasibility, records keeping in different sections of feed mill. Experiential learning at the feed plant for preparing feed, urea molasses mineral blocks, mineral mixture. species.	Dr. Pankaj kumar singh	17

Reference Books:

1. Principles of Animal Nutrition and Feed Technology by D.V. Reddy
2. Applied Nutrition (Livestock, Poultry and Lab. Animal etc.) by D.V. Reddy
3. Animal Nutrition in the Tropics by S.K. Ranjhan
4. Animal Nutrition and Feeding Practices by S.K. Ranjhan
5. Feeds and Principles of Animal Nutrition by G.C. Banerjee
6. Animal Nutrition by L.A. Maynard & J.K. Loosli
7. Animal Nutrition by P. McDonald
8. Laboratory manual developed by Department of Animal Nutrition, BVC, Patna

PG COURSE SYNOPSIS/LECTURE SHEDULE OF ANIMAL NUTRITION

ANN 604- FEED CONSERVATION, STORAGE AND QUALITY CONTROL (2+2)

Objective

B. Theory

SN	Units	topic of course	Instructor Name	No. of classes
1	Unit-1	Principles of feed and fodder processing and preservation techniques, their merits and demerits. Procurement, planning and purchase procedures; traditional and modern farm level storage structures. Feed storage and godown management, estimation of storage capacity and stack plan.	Dr. Kaushalendra kumar	10
2	Unit-2	Evaluation of processed and preserved feeds and forages. Role of moisture, temperature and relative humidity during storage of feedstuffs and their effect on biotic factors. Handling and storage of liquid feed Ingredients. Physical and chemical changes in feeds during storage; storage losses; insect pests and rodents in feed stores and their control; Role of fungi, tolerance limits and measures to check them in stored products.	Dr. Kaushalendra kumar	15
3	Unit-3	Factors affecting the quality of feed and feedstuffs on preservation. Microbiological evaluation of processed and preserved feeds, Effect of preservation on nutritional value of feed. Properties and mode of action of pesticides and fumigants; principles of good sanitation and hygiene of godowns	Dr. Kaushalendra kumar	10
	Unit-4	Proximate composition, Limitations of various systems of analysis, partitioning of forage fibre by Van Soest method, Quality control of fed ingredients, Specifications of feed ingredients and finished feeds, BIS standard., Pesticide and insecticide residues in feeds	Dr. Kaushalendra kumar	06
B.		**Practical**		
4	Unit-1	Laboratory evaluation of preserved and processed feed and forages. Physical properties of feeds and feedstuffs; identification of insect-pests and fungi in stored products; techniques for detection of hidden infestation in grains; quality control and inspection of stored feed materials; moisture equilibrium determination and estimation of chemical changes including	Dr. Kaushalendra kumar	34

		alcoholic acidity, rancidity and uric acid in feeds during storage. Weende proximate analysis, Van Soest fibre fractionation, Enzymatic evaluation, Pro rata deduction (Feed laws), urea, FFA, peroxide value, adulterants, and heavy metal		

Reference Books:

1. Principles of Animal Nutrition and Feed Technology by D.V. Reddy
2. Applied Nutrition (Livestock, Poultry and Lab. Animal etc.) by D.V. Reddy
3. Animal Nutrition in the Tropics by S.K. Ranjhan
4. Animal Nutrition and Feeding Practices by S.K. Ranjhan
5. Feeds and Principles of Animal Nutrition by G.C. Banerjee
6. Animal Nutrition by L.A. Maynard & J.K. Loosli
7. Animal Nutrition by P. McDonald
8. Laboratory manual developed by Department of Animal Nutrition, BVC, Patna

PG COURSE SYNOPSIS/LECTURE SHEDULE OF ANIMAL NUTRITION

ANN 609- NON CONVENTIONAL FEEDSTUFFS AND TOXIC CONSTITUENTS / ANTIMETABOLITES IN ANIMAL FEEDSTUFF (2+1)

A. Theory

SN	Units	topic of course	Instructor Name	No. of classes
1	Unit-1	Present and future feed requirements and current availability for livestock and poultry. Use of non-traditional feeds – By-products of agricultural, industrial, food processing units and forest by-products. Evaluation by chemical and biological methods. Formulation of economical rations. Level of inclusion of various non-conventional feeds in livestock ration	Dr. Pankaj kumar singh	17
2	Unit-2	Classification of toxic principles in animal feedstuffs. Chemico-physical properties of various toxins. Effect of toxins on biological system and nutrients utilization in different species of livestock. Detoxification of toxin principles by various physical, chemical and biological techniques. Insecticide and pesticide residue detection.	Dr. Pankaj kumar singh	17
B.		**PRACTICAL**		
3	Unit-1	Estimation of various protease inhibitors; tannins; and mycotoxins in various feeds and feedstuffs. Nitrates, HCN, oxalates, insecticide and pesticide residues, saponins, Gossypol, mimosine, heavy metals.	Dr. Pankaj kumar singh	17

Reference Books:

1. Principles of Animal Nutrition and Feed Technology by D.V. Reddy
2. Applied Nutrition (Livestock, Poultry and Lab. Animal etc.) by D.V. Reddy
3. Animal Nutrition in the Tropics by S.K. Ranjhan
4. Animal Nutrition and Feeding Practices by S.K. Ranjhan
5. Feeds and Principles of Animal Nutrition by G.C. Banerjee
6. Animal Nutrition by L.A. Maynard & J.K. Loosli
7. Animal Nutrition by P. McDonald
8. Laboratory manual developed by Department of Animal Nutrition, BVC, Patna

Syllabus Ph.D. details:/LECTURE SHEDULE OF ANIMAL NUTRITION

ANN 701 -MODERN CONCEPTS OF FEEDING RUMINANTS AND FORAGE UTILAZIATION (3+0)

A- Theory

SN	Units	topic of course	Instructor Name	No. of classes
1	Unit-1	Developments in ruminant digestive physiology – Energy protein requirement and measurement – Requirements of other nutrients. Importance of energy and protein quantity and quality Feed input and milk output relationship.	Dr. Kaushalendra kumar	14
2	Unit-2	Concept of limiting amino acids for high yielders. Strategic feeding of high yielding dairy cows and meat producing ruminants. Concept of Phase feeding. Bypass Nutrient technology. Feeding during stress. Nutrition-immunity interaction. Designer milk and meat. Rumen manipulation to reduce methanogenesis. Nitrogen oxide emission and heavy metal residues. Metabolic profile tests.	Dr. Kaushalendra kumar	15
4	Unit-3	Use of conserved forages in ruminant feeding. Chemical composition of common and newer forage – Factors affecting nutritive value of commonly available grasses, pastures, silage, hay and crop residues, voluntary intake of fodder at different stages of growth. Newer methods of forage evaluation – calculated in vitro ME and DOMD by using prediction equations. Merits and demerits of using leaf protein. Top feeds and their effective utilization – pasture consumption and evaluation studies.	Dr. Kaushalendra kumar	20
	Unit-4	Seminars on current topics of special interest.	Dr. Kaushalendra kumar	4

Reference Books:

1. Principles of Animal Nutrition and Feed Technology by D.V. Reddy
2. Applied Nutrition (Livestock, Poultry and Lab. Animal etc.) by D.V. Reddy
3. Animal Nutrition in the Tropics by S.K. Ranjhan
4. Animal Nutrition and Feeding Practices by S.K. Ranjhan
5. Feeds and Principles of Animal Nutrition by G.C. Banerjee
6. Animal Nutrition by L.A. Maynard & J.K. Loosli
7. Animal Nutrition by P. McDonald
8. Laboratory manual developed by Department of Animal Nutrition, BVC, Patna

DEPARTMENT OF ANIMAL NUTRITION, BIHAR VETERINARY COLLEGE, PATNA

M.V.Sc. & Ph.D Routine

Monsoon Semester: 2018-19 (w.e.f 02.08.2018)

Days	10-11 AM	11-12 AM	12 -1.00PM	1-2 PM	2 -3 PM	3 -4 PM	4-5 PM
Monday	ANN-601 (T), CM	ANN-603 (P) PK		Lunch Break	ANN-602(T) SK	ANN-701(T) KK	
Tuesday	ANN-602 (T) SK		**Nutrition (PK)**		ANN-601 (T) CM	ANN-602(P) SK	
Wednesday	ANN-604 (T) KK	ANN-609(P) PK			ANN-602(T) SK	ANN-701(T) KK	
Thursday	ANN-604 (T) KK	ANN- 609 (T) PK	**Nutrition (KK)**		ANN-603(T) PK	**Nutrition (Pract A) SK**	
Friday	**ANN-701(P) KK**		**Nutrition (SK)**		**Nutrition (Pract B) SK**		
Saturday	ANN- 609 (T) PK	ANN-604 (P) KK			ANN-601 (T) CM	ANN-604 (P) KK	

10/8

(Chairman)

Memo No. /ANN/BVC, Patna Dated :

Copy Forwarded to DRI-cum-Dean, PGS, BASU, Patna/Dean, BVC, Patna/All instructors for information and needful

Note: CM- Chandramoni, PK- Pankaj Kumar, KK- Kaushalendra Kumar, SK- Sanjay Kumar