

### Nutrition and Clinical Nutrition Course Specification

Basic Information	
Course Code	2ANUT, 2BNUT
Course Title	Nutrition and Clinical Nutrition
Academic Year	Second
Academic Program	Bachelor of Veterinary Sciences
Hours/week	Lectures: 3                      Practical: 2
Term	First and Second

#### 1. Course Aim

By the end of this course, students should:

Gain the basic principles of nutrition and clinical nutrition including the types of nutrients, feed additives and methods of feeding in different animals, in addition to acquiring the skills of analyzing and evaluating feed and formulating ration for different animals.

#### 2. Intended Learning Outcomes

##### 2.1. Knowledge and Understanding

**By the end of completion of this course, the student should be able to:**

- 2.1.1. Define the basic terms in the fields of animal nutrition.
- 2.1.2. Explain methods of nutrition for different farm animals.
- 2.1.3. Outlines the basic principles of animal feeding.
- 2.1.4. Discuss the role of different nutrients and feed additives.
- 2.1.5. Write short notes on nutrition of animals according to species production.
- 2.1.6. Summarize nutrient deficiency diseases of animals according to age.

##### 2.2. Intellectual Skills

**By successful completion of this course, the student should be able to**

- 2.2.1. Group the causes suspected to nutrient deficiency diseases.
- 2.2.2. Discriminate reasons and prevention of nutrient deficiency diseases.
- 2.2.3. Propose a suitable method for making the ration for different animals according to purpose.
- 2.2.4. Design a feeding program to improve animal performance according to species.
- 2.2.5. Modify nutrient schedules in response to avoid nutrient deficiency diseases.
- 2.2.6. **Choose suitable feed ingredients for different animal species and age.**
- 2.2.7. **Solve problems arising from feeding farm animal incorrect rations.**

##### 2.3. Practical and Professional Skills

**By the end of this course, the student should be able to**

- 2.3.1. Analyze different feed sample for detection its nutrient composition.

- 2.3.2. Deal with problems arising from feeding farm animal incorrect rations.
- 2.3.3. Design system of feeding different animals according to type of production.
- 2.3.4. Prepare and process a feed according to animal species.
- 2.3.5. Formulate ration for farm animals, poultry and fish according to the nutrients requirements guidelines.

#### 2.4. General and Transferrable Skills

**By the end of this course, the student should be able to**

- 2.4.1 Deal ethically with faculty staff, colleagues and stakeholders,
- 2.4.2 Work in a multidisciplinary team,
- 2.4.3 Search the web for a given course topic to build up a review,
- 2.4.4 Demonstrate personal skills.

### 3. Course Contents

#### 1st Semester

Topic	No. of hours	Lectures	Practical	ILOS
<ul style="list-style-type: none"> <li>▪ Course description, the animal body and its food</li> </ul>	3	3	--	2/1/1- 2/1/3
<b>General Nutrition</b>				
<ul style="list-style-type: none"> <li>▪ The role and requirement of water</li> </ul>	3	3	--	2/1/4
<ul style="list-style-type: none"> <li>▪ Carbohydrates in animal nutrition</li> </ul>	4	4	--	2/1/4- 2/1/3- 2/2/4
<ul style="list-style-type: none"> <li>▪ Lipids in animal nutrition</li> </ul>	4	4	--	2/1/4- 2/2/4
<ul style="list-style-type: none"> <li>▪ Protein and amino acids in animal nutrition</li> </ul>	5	5	--	2/1/4
<ul style="list-style-type: none"> <li>▪ Minerals in animal nutrition</li> </ul>	7	7	--	2/1/4- 2/1/6- 2/2/7
<ul style="list-style-type: none"> <li>▪ Vitamins in animal nutrition</li> </ul>	7	7	--	2/1/4- 2/1/6- 2/2/1
<b>Feed additives</b>	4	4	--	2/1/4
<b>Clinical nutrition</b>				
Nutrition and animal health and production	4	4		2/2/2-2/1/6 2/1/4
Nutritional disorders and health of dairy animals	4	4	--	2/1/6-2/2/1 2/2/7
<ul style="list-style-type: none"> <li>▪ Technical terms</li> </ul>	2	--	2	2/3/1
<b>Feed quality , evaluation and classification</b>				
<ul style="list-style-type: none"> <li>▪ Quality and safety of animal feeds and feedstuff</li> </ul>	8	--	8	2/3/1
<ul style="list-style-type: none"> <li>▪ Evaluation of foods</li> </ul>	4	--	5	2/3/1
<ul style="list-style-type: none"> <li>▪ Classification of feeds</li> </ul>	14		15	2/3/1
<ul style="list-style-type: none"> <li>▪ Student activity               <ul style="list-style-type: none"> <li>- field trips to animal feed factories and farm animals</li> <li>-poster preparation</li> <li>- mini-reviews and presentation</li> </ul> </li> </ul>				2/4/1- 2/4/2- 2/4/3- 2/4/4

<b>2<sup>nd</sup> Semester</b>				
<b>Feeding Standards</b>				
▪ Feeding standards for maintenance and growth	5	5	--	2/1/5
▪ Feeding standards for fattening	3	3	--	2/1/5
▪ Feeding standards for reproduction and lactation	4	4	--	2/1/2- 2/1/5
<b>Special Nutrition</b>				
▪ Feeding dairy cattle on drylot rations	3	3	--	2/1/2
▪ Feeding dairy beef for meat production	2	2	--	2/1/2-2/2/6
▪ Nutrient requirements and feeding of sheep and goats	5	5	--	2/1/2- 2/1/5- 2/2/4
▪ Camel nutrition and feeding	3	3	--	2/1/2-2/2/5
▪ Nutrient requirement and feeding of horses.	3	3	--	2/1/2- 2/2/3
▪ Poultry nutrition and feeding	8	8	--	2/1/2- 2/1/6- 2/2/5-2/2/4
▪ Rabbit nutrition and feeding	3	3	--	2/1/2-2/1/5- 2/1/6
▪ Fish nutrition and feeding	3	3	--	2/1/2- 2/2/6
▪ Dog and cat nutrition and feeding	3	3	--	2/1/2
▪ Feed preparation and processing	4	--	4	2/3/4
▪ Ration formulation for poultry	6	--	6	2/3/4- 2/3/3
▪ Ration formulation for growth and fattening	3	--	3	2/3/5
▪ Ration formulation for lactating cattle	6	--	6	2/3/3-2/3/5
▪ Ration formulation for sheep and goats	3	--	3	2/3/2-2/3/5
▪ Ration formulation for horse	3	--	3	2/3/5
▪ Ration formulation for rabbit	3	--	3	2/3/5
▪ Ration formulation for fish	2	--	2	2/3/5
▪ Student activity - field trips to animal feed factories and farm animals -poster preparation - mini-reviews and presentation				2/4/1- 2/4/2- 2/4/3- 2/4/4
<b>Total</b>	150	90	60	

#### 4. Teaching and Learning Methods

Lectures:	Interactive lectures through: <ul style="list-style-type: none"> <li>• Student involvement in the discussions</li> <li>• The use of datashow for demonstration of electronic slides and videos tutorials.</li> </ul>
Practical sessions:	<ul style="list-style-type: none"> <li>• Laboratory analysis of feedstuffs.</li> </ul>

- Identification of feed ingredients.
- Training on ration formulation and using standard tables.
- Slideshow exams.

Self-Learning activities:

- Field trips to animal feed factories and animal, poultry and fish farms.
- Poster preparations
- Mini-reviews and presentations

### 5. Teaching and Learning Methods for Students of Limited Capabilities

- Activating staff office hours.
- Additional revisions for previously taught and difficult topics.
- Providing a summary for previous chapter at the end of each one.
- Following up student feedbacks.

6.1. Methods	6. Student Assessment			
	Intended Learning Outcomes Covered			
	KU	IS	PPS	GTS
Written exams	2.1.1/2.1.2/2.1.3 2.1.4/2.1.6/2.1.5	2.2.1/2.2.3/2.2.7		
Practical exams			2.3.1/2.3.2/2.3.3 2.3.4/2.3.5	
Oral exams		2.2.2/2.2.4/ 2.2.5 / 2.2.6/ 2.2.7		2.4.1/2.4.4
Student Activities				2.4.1/2.4.2/2.4.3 2.4.4

KU, knowledge and understanding; IS, intellectual skills; PPS, practical and professional skills; GTS, general and transferable skills.

### 6.2. Exam Description

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|-----------------|---|
| Written exams   | <ul style="list-style-type: none"> <li>• Short essays.</li> <li>• Multiple choice questions.</li> <li>• True or false.</li> <li>• Scientific terms</li> <li>• Comparisons.</li> </ul> |
| Practical exams | <ul style="list-style-type: none"> <li>• Slideshows.</li> <li>• Ration formulation for different animal species</li> </ul>  |

	<ul style="list-style-type: none"> <li>• Feed analysis.</li> <li>• Identifying feed ingredients.</li> </ul>
Oral exams	<ul style="list-style-type: none"> <li>• The students choose randomly questions/topics cards in front of the examiners' committee who have the course specification in hands.</li> <li>• The exam committee involves at least 2 examiners. Each evaluates the student by giving a separate score. The scores are then averaged.</li> <li>• The student randomly selects question cards.</li> </ul>
Student activities	<ul style="list-style-type: none"> <li>• Self-learning activities are evaluated during the semester. For details, refer to the section: "4. Teaching and Learning Methods".</li> </ul>

6.3. Assessment Schedule		6.4. Weighing of Assessments	
Exams and activities	Week (in each semester)	Per semester	Total (%)
Semester work exam	4 <sup>th</sup> , 8 <sup>th</sup> and 12 <sup>th</sup>	8	16
Student activities	Throughout the semester	2	4
Final written exam	16 <sup>th</sup>	25	50
Final Practical exam	15 <sup>th</sup>	10	20
Final oral exam	16 <sup>th</sup>	5	10
<b>Total</b>		50	100

## 7. List of References

### 7.1. Course Notes

Ahmed, HA and Mervat AA. Animal Nutrition and Clinical Nutrition. Departmental Notes, Department of Nutrition and Clinical Nutrition, Faculty of Veterinary Medicine, Damanhour University.

### 7.2. Essential Books

Animal Nutrition (1981). 3<sup>rd</sup> Ed., McDonald, F.; Edwards, R.A. and Greenhalgh  
 Animal Nutrition (2010). 10<sup>th</sup> Ed., Maynard, L.A.; Lossl., J.K., Hintz, H.F. and Warner, R.G.

### 7.3. Recommended Books

Basic Animal Nutrition and Feeding. 3<sup>rd</sup> Ed. Church, D.C. and Pond, W.C. (1988)  
 Feeds and Feeding, 3<sup>rd</sup> Ed. Cullison, A. E. (1982)  
 Large Animal Clinical Nutrition (1991). Naylor, J. M. and Ralton, S.L.  
 Animal Nutrition (2002), 6<sup>th</sup> ed, McDonald .P. Prentice hall.  
 Commercial Poultry Nutrition - 3 (2008) lesson, S., Nottingham University Press  
 Nutrient Requirements and Feeding of Finfish for Auaculture (2002), Carl D.Wbster  
 ,Chhorn lim Cabi Publishing

### 7.4. Periodicals, websites ..... etc.

- Journal of Animal Science  
 - Livestock Production Science

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- Animal Science

- **Scientific websites**

☒ [www.animal-nutrition.basf.com](http://www.animal-nutrition.basf.com).

☒ <http://www.wiley.com/bw/journal.asp?ref=0931-2439>.

☒ [http://www.alltech.com/en\\_US/Pages/Default.aspx](http://www.alltech.com/en_US/Pages/Default.aspx).

☒ [www.animalnutritiontechnologies.com](http://www.animalnutritiontechnologies.com).

☒ [www.vet.upenn.edu/.../ResidencyinSmallAnimalNutrition](http://www.vet.upenn.edu/.../ResidencyinSmallAnimalNutrition).

☒ [www.nutrition.org/education-and.../graduate-program-directory](http://www.nutrition.org/education-and.../graduate-program-directory)

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**Course Matrix for Achievement of Intended Learning Outcomes**

	Topics	Hours	Knowledge & Understanding						Intellectual Skills							Practical & Professional Skills					General & Transferable Skills				
			1	2	3	4	5	6	1	2	3	4	5	6	7	1	2	3	4	5	1	2	3	4	
1	Course description The Animal Body and its Food	3	X		X																				
2	Technical terms	2	X																						
3	General Nutrition	29			X	X		X	X	X		X			X										
4	Feed additives	3				X																			
5	Poultry nutrition and feeding	8		X				X				X	X												
6	Feed analysis, evaluation and classification	24														X									
7	Ration formulation for poultry	6																X	X						
8	Feeding Standards	15		X			X																		
9	Special Nutrition	25		X			X	X			X	X	X	X											
10	Clinical Nutrition	5					X	X	X																
11	Feed preparation and processing	2																			X				
12	Ration formulation for growth and fattening	8																				X			
13	Ration Formulation for Farm Animals, Rabbits and Fish	20															X	X		X					
	Student activity																					X	X	X	X