



Bahir Dar University
College of Agriculture and Environmental Sciences
School of Animal Science and Veterinary Medicine

Bachelor of Degree in Veterinary Science (BVSc)
“በእንስሳት ሕክምና ሳይንስ የባችለር ዲግሪ”

Harmonized Curriculum

May, 2020
Bahir Dar, Ethiopia

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EXECUTIVE SUMMARY

Name of the degree program: Veterinary Science

Name of the degree to be awarded: “Bachelor of Degree in Veterinary Science”

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Degree to be awarded by: Bahir Dar University, Subjected to the Approval of the Senate

Standard period of studies Four (4) years with 8 semesters

Commencement of the program: Each year in September starting from 2020/2021

Fees / charges: Cost-sharing

2. Background and Justification

Livestock provides essential items such as food, hides, wool, skin, draught power, fertilizer and fuel. In regions featured by pastoral and transient population farming system, milk and in some area even blood constitutes the staple diet. Much of the energy of the earth is stored in forms that are not suitable for direct consumption but animals are capable of converting many of these low quality plant materials and waste plant materials into proteins and other products of high quality nutritional value. About two billion people in developing countries annually cultivate 310 million hectares of land using 280 million draft animals, moreover manure provides 5 million tones of nitrogen fertilizer annually and in some parts of the world it serves as the only source of fertilizer and fuel. Animals and animal products play increasing role in trade and take a significant part in national economy in many countries. The growth in world meat trade is expanding at annual increasing rate over the past decade and had registered a value of \$ 41 billion in 1999, approximately 10% of the total agricultural products exported in the same year. Livestock is the only source of cash income for many pastoral communities and the only means through which pastoralists and transient population are integrated into the cash economy. In countries lacking financial institutions, livestock are the only means of storing wealth contributing to food security. Africa in spite of its huge livestock resource produces the lowest animal protein from livestock farming. Livestock production systems in Ethiopia are generally subsistence oriented and productivity is very low, 8 kg of beef is produced annually per head of cattle compared to 10.7 kg in the Sudan, 14 kg in Kenya, 51 kg in Australia and Argentina and 79 kg in the USA (FAO, 1995).

Milk production from indigenous cows ranges from 200-250 kg in a lactation period of 150-200 days. Annual lambing and kidding rates are only 1.2 and 1.5 respectively (Alemu and Zinash, 2002). The country is not self-sufficient in animal products so that in order to meet the increased local demand, Ethiopia imported large volume of milk and milk products in the form of food aid and commercial products. Between 1980-1988, Ethiopia imported 139 thousand tones of milk USD 161 million (Belachew, 1990). The contributions of agriculture to the Ethiopian national economy according to the report by the US Department of State (2004) agricultural products like coffee, cereals, pulses, oilseeds, the stimulant chat, meat,

hides, and skin, contribute 45 percent of the \$6.1 billion GDP. Livestock products alone contribute 40 percent of the agricultural GDP and 20 percent of the total GDP (Aklilu, 2002). Ethiopia also has an underdeveloped export industry in livestock and livestock products. Ethiopia's meat exportation has improved very little over the last decade. The country exports almost no poultry meat, in addition to very little beef and sheep meat. The country's live animal export market is almost as troubled. The meat exportation remained slightly more stable at extremely low levels (Ahmed, Hurissa et al., 2003). Major constraints in livestock development are widespread animal diseases, poor nutrition, poor animal breeding and husbandry practices and shortages of well trained manpower. The data provided by the FAO expert reveals that out of the world total 318,850 veterinarians, 240,851 are found in developed countries which accounts to 75.5% of the total compared to 77,999 or 24.5% in the developing countries.

1.1. Veterinary Service and Livestock Production in Ethiopia

Ethiopia covers several ecological zones with a wide variety of natural resources, many of which are favorable to various species of animals. Ethiopia possesses the largest livestock population in Africa, which is currently estimated to be 59.5 million cattle, 31 million sheep and 30 million goats, 8.6 million of equines, over one million of camels, 42.9 millions of poultry and 4.6 millions of bee colonies (CSA, 2016). The country has also considerable resources of the endemic wild animals such as Wallya, Nyala, Cheleda baboon etc. and aquatic animals of fresh water fish which used for food and export purposes. Its livestock sector has the largest resource base in Africa accounting for 17% of the cattle, 22% of the sheep, 13% of the goats, 49% of the equines and 9% of the camel population of the continent.

One of the major cause of economic losses and low productivity of livestock in Ethiopia is the existence of high prevalence of animal disease with its overt impact that include loss of farm productivity, reduced draught power output, difficult access to international market, zoonoses risks and impairment of human welfare. The direct loss due to mortality of livestock in Ethiopia is estimated to be 8-10% of the cattle, 14-16% of the sheep, and 11-13% of the goats. In addition to losses, which can be directly attributed to the infection of animals by various diseases, the impact on the agricultural sector and its development potential is far from

negligible. In economic terms, the production losses from diseases are generally estimated to be more than 900 million birr or about 150 million US dollars annually. Moreover the animal health service delivery in Ethiopia has been growing in its slow development and by now only 9% is covered by veterinarians from the total 30% coverage. FAO's recommendation in developing countries for preventive service is a minimum of one veterinarian for 37,000 livestock unit (LU), and for curative purpose one veterinarian for 5,000 LU but Ethiopia with its huge livestock population at present remains unsatisfactory with the number of veterinarians (less than 600 veterinarians (MoARD, 2009) veterinarian available but more than 39,200,000 LU) and with this trend the country is going to face the globalization trade with subsistent economy heavily dependent on traditional agriculture. The ratio, therefore, between the veterinarians and livestock population is not compatible to meet the desire target of the work in the veterinary discipline. Modern animal health services in Ethiopia started in the 1910's with the aim of improving productivity and trades in animals, animal products as well as protecting the public from zoonotic diseases. Despite one century of experience on modern animal health activities there exists very few legislation and regulations on animal disease control and meat inspection, standards on drug importation and standardized use of veterinary drugs (DACA, 2006) and all this are associated with lack of adequate and competent professionals.

Therefore, need assessment survey was conducted by the college of Agriculture and Environmental Sciences in November 2011 in 23 districts of indicted that launching of Bachelor Veterinary Science degree curriculum which is cost effective, compatible for extension service in rural districts, and enable to produce competitive, versatile jobs, self employed veterinarians and which can promote better consultancy services on animal health and animal production to end-users. Moreover, the Curriculum for BVSc should incorporate the major competencies demanded for improved accomplishment of extension service delivery in urban and periurban farmer. Following a specifically defined prerequisite program, there could be a two- or three-year core program, standardized across the country. This would be followed by a one- or two-year program in an area of professional focus, which would lead to a DVM (professional focus) or MSc degree. If desired, a postgraduate program could follow, leading to additional advanced degrees e.g., PhD. The professional focused training could be provided in institutions that are different from those providing the coretraining

1. 2. Rationale of the Program

- Veterinary Science needs constant updating especially on the recent trends and thrusts of the veterinary profession.
- The need for qualified manpower to meet the requirements of various livestock development activities in federal and regional agricultural offices, educational and research institutions, and other organizations.
- The need for integrating the knowledge of veterinary Science with that of animal production.
- The needs to produce competent self employed veterinarians and promote better consultancy services on animal health and animal production to end-users
- The region's huge potential in the livestock, poultry and honey production.
- The presence of potentially high producing indigenous dairy cattle (Fogera), small ruminants (Washera and Dangla) and poultry (Tilili) in the region.
- In order to enhance animal food resources both in quantity and quality with due consideration to human health, environment, tradition and culture of people.
- To promote self confident public and private veterinarians by improving the knowledge and skill and entrepreneurship.
- Enhancement of animal disease research and extension with special emphasis on livestock health and production problems in different agro-ecological zones of the country.
- The need to harmonize of curricula of veterinary education in Ethiopia.
- Enhancement of the educational sector development plan of Federal Democratic Republic of Ethiopia.
- The need to have continuous professional development.
- Enhancement of the Agricultural Development Led Industrialization (ADLI) strategic economic policy and the animal husbandry extension.
- Increment of public and government awareness on the potential risk of major livestock diseases, which in turn forces the exporting countries to take more effective control measures to diseases of international trade significance.
- The possible spread of infectious diseases due to globalization, increased international travel and weather and environmental changes.
- The need of upgrading the international trade of livestock and livestock products by

controlling diseases with enhancement of increased professional in the field service, laboratory activities and researchworks.

- The requirements of develop teaching and learning on the basis of the countriesneed.
- The opportunity to receive international feedback onteaching.
- The continuous need of improvement in the quality of degrees and evaluationculture.
- The requirement of develop quality assurance for degrees and compare the quality of degrees with highstandards.
- Ensure the health and well-being of animals and humans by the main task of veterinary science.

2. Program Objectives and Graduate Profile

2.1 Objectives of the Program

2.1.1. General Objective

- ✓ The general objective of the program is to create animal health professionals that have high concern to the interests of the society in implementing the livestock development programs of the country.

2.2.2. Specific Objective

- ✓ To produce animal health professionals that will effectively handle individual clinical cases.
- ✓ To produce sufficient number of animal health professionals that will fill the gap of animal health services in every corner of the country
- ✓ To produce professionals that could be involved in the different government and private animal health activities.
- ✓ To produce trained professionals that will be involved in animal disease prevention and control programs in the country.

2.2 Graduate profile

- At the end of the program graduates will be able to:

2.2.1. Knowledge

- ✓ Know the normal structures, biochemical compositions and functions of the body of domestic and wild animals
- ✓ Know and understand the normal behavior, welfare, and production and breeding principles of different species of domestic animals.
- ✓ Know about various animal disease causing agents (their biology, epidemiology, pathogenesis etc)
- ✓ Have detailed knowledge of major livestock diseases and their impact on the agricultural sector
- ✓ Have knowledge on the prevention and control of major national and transboundary animal diseases
- ✓ Understand principles of animal disease treatment, handling and toxicity of various drugs, chemicals and biological

- ✓ Know ways of promoting and maintaining human health through the application of veterinary public health principles in the provision of safe, sound and wholesome foodstuffs of animal origin, and the control of zoonoses
- ✓ Know about livestock economics, entrepreneurship and business management principles

2.2.2. Skills

- ✓ Perform outbreak control and prevention and advise/train farmers in farm animal disease control
- ✓ Collect and interpret clinical and research information, advise and teaching on animal health and production, welfare and ethics
- ✓ Selecting and collecting specimens for laboratory tests and interpreting results
- ✓ Present ideas and evidences orally and written form
- ✓ Performing clinical, surgical and theriogenological procedures
- ✓ Performing artificial insemination and pregnancy diagnosis
- ✓ Performing meat inspection in abattoirs

2.2.3. Attitude

- ✓ A person of higher creativity, social consciousness, and professional ethics with a sense of responsibility to work towards national goals and development.
- ✓ Conduct productive professional activities in accordance with ethical and legal codes for the well-being of animals and the benefit of the society
- ✓ Recognize limitations in one's expertise and seek further knowledge in the area of own specialization and supportive fields
- ✓ Make one ready to learn from the environment and the local community, respect values and traditions of the society and add scholarly contributions to them.

4. Academic Requirements

4.1 Admission Requirements

- ✓ Generally, the criteria set by Ministry of science and higher Education (MoSHE) for admission will be applied to full time regular students. Applicants for the evening and summer program, on the other hand, will be treated according to the rules and regulations of continuing education program of the University. The optimum number of students to be enrolled may depend on the availability of staff, facilities, running

cost, and teaching material/aids. Students to be admitted in evening and summer program must be diploma holders in animal health, biology, animal science with a minimum CGPA of 2.00 and above.

4.2 Duration of the Study

- ✓ The total duration of the program for the **regular program** is **four years**. One academic year consists of two semesters. The duration of the **summer program** is **seven years**; one summer program will have 2 months and 10 days. The duration of the **evening program** is **five years**, each year having three semesters (semester I, semester II and Kiremt).

4.3 Graduate Requirement

- According to the rules and regulations of Bahir Dar University, students in this program will be able to graduate if and only if they:
- ✓ The overall student's workload in ECTS credit point is 180. The minimum and maximum load per semester is 25 and 32 CP respectively. Students will be evaluated for each course according to load given to lecture, tutorial and practical, etc.
- ✓ Score minimum CGPA of 2.0 for the total number of calculable ECTS for which they have been registered No 'F' grade for any course they have been registered as per the universities legislation.

4.4 Medium of instruction

- ✓ The medium of instruction for the program is **ENGLISH**.

4. Teaching and Learning Methodology

- ✓ The teaching and learning process in this program will be aimed at developing students' greater independence in solving problems independently and with group's. The program will highly emphasize on student centered approach. In realizing this student will go through the following activities in one or another way in their stay in the department. Those activities are: lectures, term papers, research projects, presentations, practical reports, debate and Discussions, case studies, laboratory works and reports, book/journal review, etc.

5. Degree Nomenclature

- ✓ The undergraduate Animal Production and Technology program leads to a certification referred in English as: "**Bachelor of Degree in Veterinary Science (BVSc)**" in Amharic as "**የባችለር ዲግሪ በእንስሳት ህክምና ሳይንስ**"

6. Mode of delivery and Assessment and Evaluation

6.1. Mode of delivery

- ✓ Mixed type of course delivery system will be followed. Some courses within a given module will be given in block and while others in parallel depending on the module.

6.2. Mode of Assessment

- ✓ Continuous assessment process will be followed during course delivery, which will constitute 50% weight in the total mark and final exam, which will constitute 50%.
- ✓ The assessment methods that will be employed in the assessment process are:
 - ✓ Quizzes
 - ✓ Assignments
 - ✓ Practical examinations
 - ✓ Test
 - ✓ project, field practice and seminars

6.3. Grading System

- ✓ The grading system that will be employed in this program is according to the University Legislation.

7. Assignment of Codes

- ✓ The course code will have four alphabets and four digit numbers. The four alphabets code indicates the name of the program with the first alphabet capital letter, i.e. all courses designed by **program** are coded as 'Vtsc' indicates Veterinary Science. The four digit numbers indicate the year of course offering (the first number indicates the level of the course in terms of the year, accordingly '1' for 1st year, '2' for 2nd year and '3' for 3rd year courses), the middle numbers indicates module code number in the program (01, 02, 03, 04, 05, 06, 07, 08, 09, 10)., the last number indicates order of the course within the module

8. List of Modules, Courses and their Status

Module No	Module	Module code	Status	Course Code	Name of Courses
01	Biomolecular Sciences	Chem-S2011	Compulsory	Chem2011	Vet. Biochemistry
				Chem 2012	Introduction to Molecular Biology
02	Veterinary Anatomy and physiology	Vtsc-S2021	Compulsory	Vtsc2021	Veterinary Gross Anatomy
				Vtsc2022	Veterinary physiology
				Vtsc2023	Veterinary Histology
				Vtsc2024	Veterinary Embryology
03	Animal disease agents and immunity	Vtsc-S2031	Compulsory	Vtsc2031	Veterinary Parasitology
				Vtsc2032	Veterinary Microbiology
				Vtsc2033	Veterinary Immunology
04	Veterinary Pathology	Vtsc-S2041	Compulsory	Vtsc2041	Veterinary Pathology
				Vtsc4042	Veterinary Clinical Pathology
05	Veterinary pharmacology and toxicology	Vtsc-S3051	Compulsory	Vtsc3051	Veterinary Pharmacology and therapeutics
				Vtsc3052	Veterinary Toxicology
06	Animal disease and preventive medicine	Vtsc-S3061	Compulsory	Vtsc3061	Veterinary General Medicine
				Vtsc3062	Large animal medicine
				Vtsc3063	Small animal medicine
07	Veterinary clinical diagnosis and practice	vtsc-S3071	Compulsory	Vtsc3071	Veterinary clinical diagnosis
				Vtsc3072	Veterinary clinical practice I
				Vtsc4073	Veterinary clinical practice II
08	Veterinary Epidemiology and animal health Economics	Vtsc-S3081	Compulsory	Vtsc3081	Animal health Economics
				Vtsc-4082	Veterinary epidemiology and preventive medicine
09	Veterinary Surgery and Diagnostic Imaging	Vtsc-S3091	Compulsory	Vtsc3091	Veterinary surgery and diagnostic imaging
10	Animal Health Extension and Business mgt	AhebS 3101	Compulsory	Aheb3101	Animal health extension and pastoralism
				Aheb 4102	Entrepreneurship
11	Veterinary Ethics and Animal Welfare	Vtsc-S3111	Compulsory	Vtsc3111	Vet. Ethics and animal welfare
12	Veterinary Gynecology and reproductive technology	Vtsc-S3121	Compulsory	Vtsc-3121	Veterinary Gynecology and reproductive technology

13	Fish and Honey bee production and disease	Vtsc-S3131	Compulsory	Vtsc-3131	Apiculture and bee disease
				Vtsc4132	Fisheries and fishes diseases
14	Research tools in Veterinary science	VtscS4141	Compulsory	Vtsc4141	Biostatistics and Research Methodology
				Vtsc-4142	Seminar on Current topics in Veterinary Science
				Vtsc-4143	Senior Research Project
15	Veterinary public health	Vtsc-S4151	Compulsory	Vtsc-4151	Veterinary public health
16	Internship (General veterinary practice)	Vtsc-S 4161	Compulsory	Vtsc-4161	Veterinary Clinical Experience
				Vtsc-4162	Veterinary Laboratory Work Experience
				Vtsc-4163	Farm Experience
				Vtsc-4164	Experience in Veterinary Public Health
17	Animal Husbandry	Anpt-S2171	Supportive	Anpt-2171	Animals Genetics and Breeding
				Anpt-2172	Small ruminant and swine production
				Anpt-2173	Animal feeds and nutrition
				Anpt-2174	Dairy and beef cattle production
				Anpt3175	Working animal management
18	Poultry and Camel production and health	Vtsc-S3181	Compulsory	Vtsc-3181	Poultry production and health
				Vtsc-3182	Camel production and health

9. Semester Breakdown

Year I semester I

Module No	Module and Aligned courses	Course Code	Delivery	No. of weeks	Cr.hr			ECTS				CP
					L	P	T	L	P	T	Home	
	Mathematics for Natural Sciences	Math1011	Parallel	16wks	3	0	2	3	0	2	5	5
	Communicative English Language Skills I	FLEn1011	Parallel	16wks	3	0	0	3	0	0	7	5
	Geography of Ethiopia and the Horn	GeES1011	Parallel	16wks	3	0	0	3	0	0	7	5
	General Physics	Phys1011	Parallel	16wks	2	0	1	2	0	1	7	5
	General Psychology	Psyc1011	Parallel	16wks	3	0	0	3	0	0	7	5
	Critical Thinking	LoCT1011	Parallel	16wks	3	0	0	3	0	0	7	5
	Physical Fitness	SpSc1011	Parallel	16wks	1	1	0	1	1	0	0	P/F
Total												30

Year I Semester II

Module No	Module and Aligned courses	Course Code	Delivery	No. of weeks	Cr.hr			ECTS				CP
					L	P	T	L	P	T	Home	
	Introduction to Emerging Technologies	EmTe1012	Parallel	16wks	2	0	3	2	0	3	5	5
	Communicative English Language Skills II	FLEn1012	Parallel	16wks	3	0	0	3	0	0	7	5
	History of Ethiopia and the Horn	Hist1012	Parallel	16wks	3	0	0	3	0	0	7	5
	General Chemistry	Chem1012	Parallel	16wks	2	3	0	2	3	0	5	5
	General Biology	Biol1012	Parallel	16wks	2	3	0	2	3	0	5	5
	Moral and Civic Education	MCiE1012	Parallel	16wks	2	0	0	2	0	0	6	4
	Social Anthropology	Anth1012	Parallel	16wks	2	0	0	2	0	0	6	4
Total												33

Year II Semester 1

Module No.	Module and Aligned courses	Course Code	Delivery	No. of weeks	Cr.hR			ECTS				CP
					L	P	T	L	P	T	Home	
01	Biomolecular Sciences	Chem S2011										
	Vet. Biochemistry	Chem2011	parallel	16	2	1	0	2	1	0	7	5
02	Veterinary Anatomy and physiology	Vtsc-S2021										
	Veterinary Gross Anatomy	Vtsc2021	Parallel	16	3	1	0	3	1	0	10	7
	Veterinary physiology	Vtsc2022	Parallel	16	2	1	0	2	1	0	7	5
	Veterinary Histology	Vtsc2023	Parallel	16	2	1	0	2	1	0	7	5
	Veterinary Embryology	Vtsc2024	Parallel	16	1	0	0	1	0	0	3	2
17	Animal Husbandry	Anpt-S2171										
	Animals Genetics and Breeding	Anpt-2171	Parallel	16	1	1	0	1	1	0	4	3
	Small ruminant and swine production	Anpt-2172	Parallel	16	2	1	0	2	1	0	7	5
Total											32	

Year II Semesters II

Module NO.	Module and Aligned courses	Course Code	Delivery	N0. of weeks	Cr.H			ECTS				CP
					L	P	T	L	P	T	Home	
01	Biomolecular Sciences	Chem S2011										
	Introduction to Molecular Biology	Chem 2012	Parallel	16	1	1	0	1	1	0	4	3
03	Animal disease agents and immunity	Vtsc-S2031										
	Veterinary Parasitology	Vtsc2031	Parallel	16	3	2	0	3	2	0	9	7
	Veterinary Microbiology	Vtsc2032	parallel	16	3	2	0	3	2	0	9	7
	Veterinary Immunology	Vtsc2033	Parallel	16	1	1	0	1	1	0	4	3
17	Animal Husbandry	Anpt-S2171										
	Animal feeds and nutrition	Anpt-2173	Parallel	16	1	1	0	1	1	0	4	3
	Dairy and beef cattle production	Anpt-2174	Parallel	16	1	1	0	1	1	0	4	3
04	Veterinary Pathology	Vtsc-S2041										
	Veterinary Pathology	Vtsc2041	Parallel	16	3	2	0	3	2	0	9	7
Total											33	

Year III Semesters I

Module NO.	Module and Aligned courses	Course Code	Delivery	No. of weeks	Cr.Hr			ECTS				C P
					L	P	T	L	P	T	Home	
05	Veterinary pharmacology and toxicology	Vtsc-S3051										
	Veterinary Pharmacology and therapeutics	Vtsc3051	Parallel	16	2	1	0	2	1	0	7	5
18	Poultry and Camel production and health	Vtsc-S3181										
	Poultry production and health	Vtsc-3181	Parallel	16	2	1	0	2	1	0	7	5
	Camel production and health	Vtsc-3182	Parallel	16	2	0	0	2	0	0	4	3
06	Animal disease and preventive medicine	Vtsc-S3061										
	Veterinary General Medicine	Vtsc3061	Parallel	16	3	0	0	3	0	0	7	5
07	Veterinary clinical diagnosis and practice	vtsc-S3071										
	Veterinary clinical diagnosis	Vtsc3071	Parallel	16	2	1	0	2	1	0	7	5
17	Animal husbandry	Anpt-S2171										
	Working animal management	Anpt3175	Parallel	16	2	0	0	2	0	0	4	3
08	Veterinary Epidemiology and animal health Economics	Vtsc-S3081										
	Animal health Economics	Vtsc3081	Parallel	16	2	0	0	2	0	0	4	3
	Global Trend	GITr1012	Parallel	16	2	0	0	2	0	0	6	4
Total											33	

Year III SemesterII

Module No.	Module and Aligned courses	Course Code	Delivery	No. of weeks	Cr.Hr			ECTS				CP
					L	P	T	L	P	T	Home	
05	Veterinary pharmacology and toxicology	Vtsc-S3051										
	Veterinary Toxicology	Vtsc3052	Parallel	16	1	1	0	1	1	0	4	3
06	Animal disease and preventive medicine	Vtsc-S3061										
	Large animal medicine	Vtsc3062	Parallel	16	3	0	0	3	0	0	7	5
	Small animal medicine	Vtsc3063	Parallel	16	2	0	0	2	0	0	4	3
09	Veterinary Surgery and Diagnostic Imaging	Vtsc-S3091										
	Veterinary surgery and diagnostic imaging	Vtsc3091	Parallel	16	2	2	0	2	2	0	6	5
07	Veterinary clinical diagnosis and practice	vtsc-S3071										
	Veterinary clinical practice I	Vtsc3072	Parallel	16	0	1	0	0	1	0	3	2
10	Animal Health Extension and Business mgt	AhebS 3101										
	Animal health extension and pastoralism	Aheb3101	Parallel	16	2	0	0	2	0	0	4	3
11	Veterinary Ethics and Animal Welfare	Vtsc-S3111										
	Vet. Ethics and animal welfare	Vtsc3111	Parallel	16	2	0	0	2	0	0	4	3
12	Veterinary Gynecology and reproductive technology	Vtsc-S3121										
	Veterinary Gynecology and reproductive technology	Vtsc-3121	Parallel	16	2	1	0	2	1	0	7	5
13	Fish and Honey bee production and disease	Vtsc-S3131										
	Apiculture and bee disease	Vtsc-3131	Parallel	16	1.5	0.5	0	1.5	0.5	0	4	3
Total											32	

Year IV: Semester I

Module No.	Module and Aligned courses	Course Code	Delivery	No. of weeks	Cr.Hr			ECTS				C P
					L	P	T	L	P	T	Home	
13	Fish and Honey bee production and disease	Vtsc-S3131										
	Fisheries and fishes diseases	Vtsc4132	Parallel	16	1.5	0.5	0	1.5	0.5	0	4	3
14	Research tools in Veterinary science	VtscS4141										
	Biostatistics and Research Methodology	Vtsc4141	Parallel	16	2	1	0	2	1	0	7	5
04	Veterinary Pathology	Vtsc-S2041										
	Veterinary Clinical Pathology	Vtsc4042	Parallel	16	2	1	0	2	1	0	7	5
07	Veterinary clinical diagnosis and practice	vtsc-S3071										
	Veterinary clinical practice II	Vtsc4073	Parallel	16	0	1	0	0	1	0	3	2
08	Veterinary Epidemiology and animal health Economics	Vtsc-S3081										
	Veterinary epidemiology and preventive medicine	Vtsc-4082	Parallel	16	3	0	0	3	0	0	7	5
15	Veterinary public health	Vtsc-S4151										
	Veterinary public health	Vtsc-4151	Parallel	16	2	1	0	2	1	0	7	5
10	Animal Health Extension and Business mgt	AhebS 3101										
	Entrepreneurship	Aheb 4102	Parallel	16	3	0	0	3	0	0	7	5
Total											30	

Year IV SemesterII

Module No.	Module and Aligned courses	Course Code	Delivery	No. of weeks	Cr.Hr			ECTS				CP
					L	P	T	L	P	T	Home	
14	Research tools in Veterinary science	Vtsc-S4141										
	Seminar on Current topics in Veterinary Science	Vtsc-4142	Block	1-3weeks	0	1	0	0	1	0	3	2
	Senior Research Project	Vtsc-4143	Parallel	16	2	3	0	2	3	0	5	5
16	Internship (General veterinary practice)	Vtsc-S4161										
	Veterinary Clinical Experience	Vtsc-4161	Parallel	16	0	2	0	0	2	0	6	4
	Veterinary Laboratory Work Experience	Vtsc-4162	Parallel	16	0	2	0	0	2	0	6	4
	Farm Experience	Vtsc-4163	Parallel	16	0	2	0	0	2	0	2	2
	Experience in Veterinary Public Health	Vtsc-4164	Parallel	16	0	1	0	0	1	0	3	2
Total											19	

10. Resources

10.6 Staff profile

To effectively implement the proposed study program, the current staff in the School of Animal Science and Veterinary Medicine will be involved. More staff in the discipline shall be employed through time and guest staff may be participated as deemed necessary. The staff of Bahir Dar Regional Veterinary Laboratory will be involved in their areas of expertise to provide courses as needed.

N o	Name of staffs	Field	Academic rank
1	Mussie H/Melelot	Trop. Vet. Medicine	Associate Prof.
2	Hailu Mazengia	Trop. Vet. Pathology	Associate Prof
3	Habtamu Tassew	Vet. Bacteriology & Animal Biotechnology	Associate Prof
4	Taddese Yayeh	Tropical vet. public health	Associate Prof
5	Biruhtesfa Asrade	Food safety(VPH)	Associate Prof
6	Yechale Teshome	Vet. Epidemiology and economics	Assistantprofessor
7	Habtamu Tamrat	Vet. Epidemiology and economics	Assistant professor
8	Yeshiwas Ferede	Vet. Epidemiology	Assistant professor
9	Tilksew Bialfew	Vet. Microbiology	Assistant professor
10	Negesse Mekonen	Vet. Preventive medicine	Assistant professor
11	Birhan Agmas	Vet. public health	Assistant professor
12	Shewatatek Melaku	Vet. Clinical medicine	Assistant professor
13	Beyenech Gebeyehu	Vet. Tropical medicine	Assistant professor
14	Workneh Wondimagegne	Vet. Surgery	Assistant professor
15	Zemene Lakew	Vet. Surgery	Assistant professor
16	Getnet Zemenu	DVM	Lecturer
17	Temesgen Sendeke	DVM	Lecturer
18	Yodit Ayalew	DVM	Lecturer
19	Andinet Yirga	DVM	Lecturer
20	Simachew Getaneh	DVM	Lecturer
21	Endris Aman	DVM	Lecturer
22	Firew Tegegne	Animal Nutrition	Assoc. Professor
23	Kefyalew Alemayehu	Animal Genetics and Breeding	Professor
24	Asamnew Tassew	Animal Genetics and Breeding	Assoc. Professor
25	Yeshambel Mekuriaw	Animal Nutrition	Assoc. Professor
26	Fentahun Meheret	Biotdecnhnology	Asst. professor
27	Damite Kebede	Animal Science	Asst. professor

28	Hirut Geremew	Food science and human nutrition	Lecturer
29	Mengistie Taye	Agricultural Biotichnology	Assoc. Professor
30	Tsigemariam Tesfa	Animal Production	Lecturer
31	Lamrot Tekilye	Animal Production	Lecturer
32	Bimrew Asmare	Animal Nutrition	Assoc. Professor
33	Netsanet Beyero	Animal Nutrition	Asst. professor
34	Esubalew Admasu	Animal Genetics and Breeding	Lecturer
35	Shewaye Hailecherkos	Feeds and Animal Nutrition	Lecturer
36	Wossenie Shebabaw	Dairy Technology	Asst. professor
37	Awraaris Getachew	Apiculture	Asst. professor
38	Tessema Aynalem	Apiculture	Asst.professor
39	Fisseha Mogess	Animal Production	Asst. professor
40	Tadelle Dessie	Animal breeding	Adjunct Professor
41	Halo Yohannes	BVSc	GA
42	Melesie Simeneh	Advanced Animal Health level IV	Senior Technical Assistant
43	Bosena Tadesse	Advanced Animal Health level IV	Senior Technical Assistant
44	Kassahun Awoke	BSc in phrmacology	Senior Technical Assistant
45	Sewagegne Lamesigen	BVSC	Chief Technical Assistant
46	Amsalework Molla	BSc in vet.laboratory technology	Chief Technical Assistant 1
47	Demsew Walelgne	Advanced Animal Health level IV	TA
48	Natnael sintayehu	Advanced Animal Health level IV	TA
49	Endalew Mekonnen	Animal Production	Chief T.A
50	Bimrew Terefe	Apiculture	Chief T.A
51	Isreal Terfas	BSC in animal production	Senior T.A
52	Amare Melese	BSC in Biotechnology	TA
53	Habtamu Tadese	BSC in animal production	TA
54	Silenat Dires	BSC in animal production	TA

10.7 .Existing physical resources and Infrastructure

- ✓ **Internet Access:** provide broad band internet access where every department staff member can have easy access.
- ✓ **Laboratories:** Currently the department has no laboratory. Making use of laboratory of other collaborative institutes (Bahir Dar Regional Laboratory, Artificial Insemination Center etc). However, construction of laboratories is under way in the new College of Agriculture and Environmental Sciences compass
- ✓ **Classrooms:** The program shares class rooms with the other programs in the College of Agriculture and Environmental Sciences.
- ✓ **Staff offices:** The program has some offices for its instructors.
- ✓ **Library and Literature** The program shares libraries and literatures with other programs in the College of Agriculture and Environmental Science.

10.3. Partnership/Cooperation

- ✓ The program has been and will continue working with MoARD, BoARD, ARARI, ILRI, and other cooperating institutes

10.4. Quality Assurance Mechanism

- ✓ Quality Assurance measures will be as per BDU quality Assurance Policy, in addition to this the BVSC will use the following strategies to assure the quality of its academic training
- ✓ By the end of the last year last semester there will be an exit exam (oral exam in selected (Large animal Medicine, Veterinary Parasitology and Clinical and Laboratory Diagnosis) by an external examiner is given. A minimum of C grade as a requirement for graduation and improve students' devotion and focus as witnessed in other university.
 - Hold regular meetings with itsstakeholders
 - Conduct institutional self assessment in consultation with theUniversity
 - Carry out survey to get employersfeedback
 - Prepare internal and external workshops to evaluate its trainingactivities
 - Provide pedagogical trainings to its newly recruited staffsmembers
 - Preparation of teaching materials, hand outs, labmanual

- The program will have also take graduate's feedback i.e. the alumni feedback and employability rate to indicate something about the quality.

10.5. Center of Excellence

- ✓ Due to the fact that College of Agriculture and Environmental Sciences School of Animal Science and Veterinary Medicine of Bahir Dar University is located at the vicinity of Lake Tana, the launching of Bachelor of Veterinary Science program is targeted to be center of excellence in Aquatic Medicine.

11. Annex: Course Guide Books

Veterinary Biochemistry



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Biomolecular Science				
Module No.	01				
Course Title	Veterinary Biochemistry				
Course code	Chem2011				
Credit Hrs/ECTS	Cr Hrs=3	Lecture Hrs= 2	Laboratory=1	Home study=7	Cp/ECTS=5
Semester	I				
Year	II				
Pre-requisites	No				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

Lecture:

Knowledge concerning the structure & function of biomolecules can provide better understanding of normal physiology as well as supply information that would be helpful in disease diagnosis, therapy and prognosis. The course gives an insight to understanding of basic veterinary biochemistry and its integration with nutrition, physiology and pathological states. Scope and importance of biochemistry; biochemistry of cellular and sub cellular components, classification, properties and chemical reactions, biochemistry of carbohydrates and polysaccharides, lipids, amino acids and peptides, structure of proteins and amino acids, enzymes and co-enzymes, enzyme kinetics and nucleic acid are included.

Practical:

Preparation of buffers, determination of pH, qualitative and quantitative tests for reducing & non-reducing sugars, saponification values of fats, color reaction of proteins, Spectrophotometry.

3. Objectives of the Courses

At the end of the course student should able to:

- ✓ Know the normal biochemistry of carbohydrate, lipid and protein and nucleic acids
- ✓ Appreciate Structure-Function relationship of Biomolecules

- ✓ Understand how nature uses various combinations of Biomolecules to create the process of life
- ✓ Define what is biochemistry
- ✓ Understand the role, scope and application of biochemistry in the area of animal nutrition & health
- ✓ Understand and explain the chemistry of biomolecules, their structure and biological functions (structure and activity relationships);
- ✓ Understand clearly about definition and major classes of enzymes, enzyme kinetics, enzyme mechanisms and enzyme regulation (enzyme activation/inhibition mechanisms);
- ✓ Understand the definition, source, major classification, mechanism of action and functions of enzyme cofactors;
- ✓ Possess skills in qualitative and quantitative bio-analytical technique operations, pH determination, buffer solution preparation and detection of the presence/ absence carbohydrates, proteins, a specific amino acid & Spectrophotometry

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcomes

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1	Chapter 1:General Introduction 1.1. The Concept of Biochemistry 1.2.Biomolecules and Macromolecules 1.3. Role of Biochemistry in creating the complexity of Life 1.4. The Cell as a Non-Random System 1.5. Metabolism: Anabolism and Catabolism 1.6. Structure-Function Relationship	Introducti on to the Concept, Principles and Scope of Biochemistry in Understanding Life Processes	✓ Attend the lecture and take notes from the lecture ✓ Forward all the clarifications/do ubts in relation to the given lecture	✓ Develop an overview & positive attitude towards the course ✓ Understand the fundamental principles of Biochemistry
2,3,4	Chapter 2: Types of Chemical Bonds, Molecular Structure & Useful Properties of Water, Elemental Composition of Living Systems 2.1. Covalent & Non-Covalent Bonds 2.2. The Importance of Non Covalent	Describe: Various Types of Chemical Bonds Illustrate the Importance of Non- Covalent Bonds	✓ Attend the lecture and take notes from the lecture	✓ Describe the Various Types Chemical Bonds in Biomolecules

5	<p>Chapter3: Carbohydrates 3.1. Definition 3.2. Classification</p> <p>Monosaccharides Disaccharides Oligosaccharides Polysaccharides</p> <p>3.3. Stereoisomerism 3.4. Chemical Bond in Carbohydrates 3.5. Functions of Carbohydrates</p>	<p>Introduce: The biochemical nature of carbohydrates and the Basis for Classification</p> <p>Describe: Property & Prerequisite for Stereoisomerism</p> <p>Importance of Carbohydrates in Nature & Physiology</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion</p> <p>✓ Ask and answering</p>	<p>✓ Understand & Conceptualize the Properties and Structure & Functions of Carbohydrates</p>
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6	<p>Chapter 4:</p> <p>Amino acids and proteins</p> <p>4.1. Classification, structure and function</p> <p>4.1. Peptide Bond</p> <p>4.2. Stereoisomerism & Optical activity</p> <p>4.3. Physiologically important peptides</p> <p>4.4. Zwitter ion & Isoelectric point</p> <p>4.5. Metabolism of Amino acids (Glucogenic & Ketogenic Amino acids)</p> <p>4.6. Biosynthesis of Glycine from Serine</p>	<p>Introduce: The Biochemical Composition & Diversity of Amino acids & Classification</p> <p>Describe:</p> <ul style="list-style-type: none"> ✓ Formation of Peptide Bond ✓ Charge on an amino acid ✓ Physiological importance of peptides ✓ Amino acids that give rise to intermediates of carbohydrate & Fat metabolism 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment ✓ Peer idea sharing 	<ul style="list-style-type: none"> ✓ Understand & Analyze the structure, function & importance of amino acids in metabolism ✓ Optical activity of amino acids ✓ Peptides with significant physiological activity ✓ Essential & Non-essential amino acids
7	<p>Chapter 5. Orders of Protein Structure</p> <p>5.1 Importance of Protein Structure in Protein Function</p> <p>5.2. Primary, Secondary, Tertiary & Quaternary Structure</p>	<ul style="list-style-type: none"> ✓ Introduce: Various levels of Protein Structure ✓ Describe: Structure-Function Relationship of Proteins 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment ✓ Peer idea sharing 	<ul style="list-style-type: none"> ✓ Develop an understanding of various levels of protein structure
8	<p>Chapter 6: Hemoglobin & Myoglobin</p> <p>6.1. Structure of Hemoglobin & Myoglobin</p>	<p>Describe: The differences in structure between Hemoglobin & Myoglobin</p>	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading 	<p>Understand & Analyze Protein structure & function</p>

			assignment	
			Peer idea sharing	
9	Chapter 7: Lipids 7.1. Composition & Properties of Lipids 7.2 Triglycerides & Ester Bond 7.3. Biological Functions of Lipids 7.4. Classification of Lipids	✓ Describe: The Properties, Classification & Biological Functions of Lipids	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	✓ Understand & Appreciate the Biological Significance of Lipids
10,11	Chapter 8: Enzymes 8.1. Nomenclature & Classification of Enzymes 8.2. Catalysis, Coenzymes, Cofactors, active and regulatory sites 8.3. Denaturation of Enzymes 8.4. Factors affecting Enzyme Activity 8.5. Enzyme Inhibition 8.6. Feed back Inhibition of Enzymes	✓ Illustrate: The importance, classification, mechanisms of action, theories/hypothesis of enzyme activity ✓ Describe: Native vs. Denatured Enzyme. ✓ Factors that affect enzyme activity ✓ Competitive vs. Non-competitive enzyme inhibition ✓ Regulation of enzyme activity	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	✓ Develop an overview of the importance of enzymes in metabolism, enzyme specificity, mechanisms of enzyme activity, co-factors vs. coenzymes, various types of enzyme inhibition & feedback regulation of enzyme activity
12,13	Chapter 9: Nucleotides & Nucleic acids 9.1. DNA & RNA Structure and Function 9.2. Formation of Phosphodiester Bond 9.3. DNA Replication 9.4. Protein Synthesis 9.5. Central Dogma of	✓ Describe: The Structure & Structural Differences between DNA & RNA. ✓ Mechanisms of DNA Replication ✓ Process of	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading	✓ Understand the Biological Importance of DNA as the Genetic material as well as its

	Biology	Transcription & Translation ✓ Central dogma & retroviruses as an exception to central dogma	assignment	role in Protein Synthesis
14	Chapter 10. Vitamins. 10.1. Classification, Dietary sources, biochemical functions and specific deficiency diseases	✓ Describe: The Importance, sources and classification of vitamins ✓ Emphasize: The diseases due to deficiency of various vitamins	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork	✓ Understand & Appreciate the Importance of Vitamins although in Trace amounts in maintaining normal physiology & health
15	Chapter 11: Minerals 11.1. Nutritional significance of dietary minerals including calcium, phosphorus, magnesium, iron, iodine, zinc and copper; trace elements (Se, Co and Mo)	✓ Describe: The functions of various minerals in important biochemical functions such as enzyme activity & normal metabolism	✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork	✓ Understand & Appreciate the Nutritional importance of Minerals
16	Final exam			
4.2.assessment strategies and techniques and courses policy				
Assessment				
• Quiz7%				
• Test.....8%				

• Assignment.....	10%
• Mid exam.....	25%
• Final exam.....	50%
• Total	100%

Courses policy

Student has to

- Attend 85% of the class
- take all continuous assessment and mid exam
- Take final exam
- Respect all rules and regulations of the university

References

1. David L.Nelson& Michael M. Cox 2008. Lehninger Principles of Biochemistry. W.H. Freeman and Company. USA
2. Malhotra V.K., 2006. Biochemistry for students. 11th Edition. Jaype brothers. New Delhi.
3. McDonald,P., Edwards,R.,Greenhalgh,J.F.D and Morgan C.A.,2002. Animal Nutrition.6th ed., (Princcice Hall,USA).
4. Tom Brody, 1999. Nutritional Biochemistry. 2nd Edition. Academic Press, California, USA.
5. D’Mello J.P.F,2003.Aminoacids in Animal Nutrition. CABI Publishing
6. Textbook of Veterinary Biochemistry. R.S. Dhanotiya. Jaypee Publishers
7. Biochemistry.U.Satyanarayana & U.Chakrapani.2012. Books & Allied Publishers.

Propose practical activity for Veterinary Biochemistry

Experiment1	Preparation of Buffer solutions, pH Determination	Observing, Performing & Writing Report
Experiment2.	Test for Reducing and Non-Reducing sugar,	Performing the Experiment & Writing Report
Experiment3.	Test for Proteins especially Aromatic and Sulfur Containing Ones(color reactions of proteins)	Performing the Experiment & & Writing Report
Experiment4.	Determination of Saponification Value of Fats	Performing the Experiment & Writing Report
Experiment5	Spectrophotometry/Calorimetry	Performing the Experiment & & Writing Report

Approval section

	Name	Signature
Chair holder		
Department head		

Introduction to Molecular Biology



Bahir Dar University
College of Agriculture and Environmental Science
School of Animal Science and Veterinary Medicine

1. Course Information

Module Name	Bio molecular Sciences
Module No.	01
Course Title	Introduction to Molecular Biology
Course code	Chem 2012
Credit Hrs/ECTS	Cr Hrs = 2, Lecture Hr = 1, Laboratory =1, Home study =4, Cp/ECTS=3
Semester	II
Year	II
Pre-requisites	None
Target group	Bachelor of Veterinary Science
Status	Compulsory
Instructor name and address	

2. Course Description:

Lecture: Cells, types/kinds of cells, comparison on prokaryotic and eukaryotic cells, cell organelles and their function; Nucleic acids (DNA and RNA), their structure and organization in cells, Central Dogma in Molecular Biology: Replication, transcription and translation in prokaryote and eukaryotes; The genetic code and amino acids; Regulation of gene expression, DNA damage and repair mechanisms; Mutation and their chemical bases, Effect of mutations, Mutations in protein coding genes; Recombinant DNA technology: Plasmids, gene cloning, restriction endonucleases; Genetic Engineering; Polymerase Chain Reaction (PCR) and its applications.

Practical: Laboratory safety, Demonstration of laboratory equipment's, pipetting at micro-volume level, cell lysis and DNA/RNA extraction from prokaryotic and eukaryotic cells; plasmid extraction from bacteria, Semi quantitative or quantitative Polymerase Chain Reaction.

3.Objectives of the Courses

At the end of the course student should able to:

- Understand cell types, cell organelles and their function
- Understand DNA and RNA including their structure and function
- Clearly describe the central dogma in molecular biology
- Understand the Genetic code
- Understand gene regulation and protein synthesis
- Understand DNA damage, mutation and their chemical bases
- Know genetic engineering
- Understand Recombinant DNA technology
- Understand Polymerase Chain Reaction and its application

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Contents and sub-contents	Methods, strategies	Student tasks	Learning Objective
1	1. Chapter 1: Introduction to cells 1.1. Types of cells 1.2. Comparison of prokaryotic and eukaryotic cells.	- Brainstorming - Introduce cells and their comparison	✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture	✓ Develops positive attitude towards the courses Describe cells and their function
2	1.3. Eukaryotic cell organelles and their function	Provide brief introduction to cell organelles and their function	✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture	✓ Describe the different types of cell organelles and their function
3	Chapter 2: Nucleic acids: DNA and RNA structure and their organization in cells	✓ Lecture on DNA and RNA structure ✓ Providing short note	✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture	Understand DNA and RNA structure
4	Chapter 3: The Central Dogma in Molecular Biology 3.1. Replication	Providing lecture on replication bacteria and eukaryotic cells	✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture	Understand replication in prokaryotes and eukaryotes

5	3.2. Transcription :	Providing lecture on transcription in bacteria and eukaryotic cells	<ul style="list-style-type: none"> ✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture 	Understand transcription in prokaryotes and eukaryotes
6	3.3. Translation	Providing lecture on transcription in bacteria and eukaryotic cells	<ul style="list-style-type: none"> ✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture 	Understand translation in prokaryotes and eukaryotes
7	Chapter 4: Genetic code and amino acids.	Lecture on the Genetic code and amino acids	<ul style="list-style-type: none"> ✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture 	Understand the genetic code/codons encoding for amino acids
8	Chapter 5: Regulation of gene expression	Provide brief introduction to gene expression and its regulation	<ul style="list-style-type: none"> ✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture 	Understand and able to describe Regulation of gene expression
9	Chapter 6: DNA damage and repair mechanisms 6.1. DNA damage	Provide lecture on DNA damage	<ul style="list-style-type: none"> ✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture 	Describe and understand DNA damage
10	6.2. DNA repair	Provide brief lecture on DNA repair	<ul style="list-style-type: none"> ✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture 	Describe and understand DNA repair
11	Chapter 7: Mutation and their chemical bases 7.1. Mutations in protein coding genes	Provide lecture notes and let them know and understand mutation	<ul style="list-style-type: none"> ✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture 	Understand and able to describe Mutation
12	7.2. Effect of mutations	Provide brief introduction to the Effect of mutations	<ul style="list-style-type: none"> ✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture 	Discuss the effects of mutations

13	Chapter 8: Recombinant DNA technology 8.1. Plasmids 8.2. Restriction endonucleases	Provide brief introduction on Recombinant DNA technology including plasmids and endonucleases	✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture	Describe Recombinant DNA technology, plasmids and restriction endonucleases
14	Chapter 9: Genetic Engineering	Lecture on Genetic Engineering	✓ Listen to the lecture and taking notes. ✓ Raising questions during the lecture	Describe how genes can be transferred from one organism to another organism
15	Chapter 10: Polymerase Chain Reaction (PCR) 10.1 Applications of PCR	Discussion about Polymerase Chain Reaction (PCR) and its application	✓ Listen to the discussion. ✓ Raising questions during the lecture	Describe and understand Polymerase Chain Reaction (PCR) and its application

16 Final exam

4.2. Assessment strategies and techniques and courses policy

Assessment

✓ Quiz	7%
✓ Test.....	8%
✓ Assignment.....	10%
✓ Mid exam.....	25%
✓ Final exam.....	50%
✓ Total	100%

Courses policy

- **Student has to**
- Attend 85% of the class
- take all continuous assessment and mid exam
- Take final exam
- Respect all rules and regulation of the university

Reference books

1. Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, and Peter Walter (2014): Essential Cell Biology. 4th Edition.
2. Robert B. Northrop and Anne N. Connor (2009): Introduction to Molecular Biology, Genomics and Proteomics for Biomedical Engineers
3. Harvey Lodish, Arnold Berk ,Paul Matsudaira, Chris A. Kaiser, Monty Krieger, Matthew P. Scott, Lawrence Zipursky, James Darnell: Molecular Cell Biology, fifth Edition.

3. PRACTICAL/ LABORATORY

Week	Practical work	Tasks	Due date for submission of report
1	Safety in Molecular laboratory	Report Writing	
2	Demonstration of laboratory equipment's, Their basic functions and handling.	Report Writing	
3	Sterilization and disinfection.	Report Writing	

4	Pipetting	Report Writing	
5	Cell lysis	Report Writing	
6 -8	DNA extraction	Report Writing	
9 -12	RNA extraction	Report Writing	
13-14	Plasmid isolation	Report Writing	
15-16	Polymerase Chain Reaction	Report Writing	
Approval section			
	Name	Signature	
Chair holder			
Department head			

Veterinary Gross Anatomy



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary Anatomy and physiology				
Module No.	02				
Course Title	Veterinary Gross Anatomy				
Course code	Vtsc2021				
Credit Hrs/ECTS	Cr Hrs=4	Lecture Hrs=3	Laboratory=1	Home study=10	Cp/ECTS=7
Semester	I				
Year	II				
Pre-requisites	No				
Target group	Bachelor of Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description; Definition, Branches of anatomy, Methods of studying anatomy, Reference planes & some descriptive of studying anatomy. Osteology :- Structure of bones, function of bones, morphological classification of bones, regional classification of bones, Axial skeleton, Appendicular skeleton, visceral skeleton. Arthrology:- Classification of joints, classification of synovial fluid, movement of joints, joints of axial skeleton, joints of Appendicular skeleton Myology:- organization of skeletal Muscle, arrangement of skeletal Muscle fibers, attachment of muscles, functional grouping of Muscle, regional grouping of muscles. Digestive system:- The alimentary canal (mouth, pharynx, esophagus, stomach, small intestine, large intestine), accessory digestive organs (salivary glands, pancreas, liver). Respiratory system: - Functional classification of respiratory organs (conducting portion, respiratory portion, pumping mechanism). Reproductive system:- Male reproductive system (testes, Epididymis, ductus deference, spermatic chord, scrotum),female reproductive system (Ovary, oviduct , uterus vagina, vestibule, vulva) urinary system (kidney, ureter, bladder, urethra), cardiovascular system:- heart, blood vessels (arteries, veins), lymphatic system (lymphatic organs, lymph vessels, nervous system:- central nervous system, peripheral nervous system), common integument and sensory organs, avian anatomy.

Practical: Structure of bones, morphological classification of bones, Regional classification of bones, regional grouping of muscles, The alimentary canal (mouth, pharynx, Esophagus, stomach, small intestine, large intestine), accessory digestive organs(salivary glands, pancreas, liver), Functional classification of respiratory organs, male reproductive system, female reproductive system, urinary system, heart, blood vessels, brain and senseorgans.

3.Objectives of the Courses

At the end of the course student should able to:

- ✓ Know medical terms and concepts related to structural and functional morphology of animals.
- ✓ Be able to describe the normal gross body structures, location and the relative relationship of the different tissues, organs, systems and functional morphology of the animal body.
- ✓ Relate the form and structure of the different body parts
- ✓ Be able to describe anatomical differences between different domestic animals.
- ✓ Be able to dissect and describe the normal gross structure, location and relationship the different organs studied.
- ✓ Appreciate the application of the learned material in practical situations and indifferent disciplines of Veterinary Medicine.

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1	1.General Introduction <ul style="list-style-type: none"> • Definition • Classification • Methods of study • Topographic terms 2. Osteology <ul style="list-style-type: none"> • Introduction • Structure of bones • Morphological and functional classification of bones 	<ul style="list-style-type: none"> ✓ Introduce the course and topographical terminologies ✓ Brainstorming ✓ Lecturing on Osteology and structure and classification of bones 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture 	<ul style="list-style-type: none"> ✓ Understand the concern of anatomy and topographical terminologies ✓ Describe Structure of bones ✓ Morphological and functional classification of bones
2	<ul style="list-style-type: none"> ✓ Regional classification of the skeleton ✓ Axial skeleton ✓ Appendicular skeleton ✓ Splanchnic skeleton 3. Arthrology <ul style="list-style-type: none"> • Introduction • Classification of joints 	<ul style="list-style-type: none"> ✓ Lecturing on Regional classification of the skeleton ✓ Brainstorming ✓ Lecturing Arthrology ✓ Group Discussion 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask& answer question ✓ Take part on 	<ul style="list-style-type: none"> ✓ Understand the difference Regional classification of the skeleton ✓ Describe different types of joints

	<ul style="list-style-type: none"> • Fibrous joints • Cartilaginous joints • Synovial joints • Articulation of axial skeleton • Articulation of appendicular skeleton 		reading assignment	
3	4. Myology <ul style="list-style-type: none"> • Introduction • Classification of muscle tissues • Organization of skeletal muscles • Regional classification of skeletal muscles • Coetaneous muscle • Muscles of the head • Muscles of the neck • Muscles of the back and loin • Muscles of the chest • Muscles of the thorax • Muscles of the abdomen 	✓ Introduce the concern of mycology and regional classification of muscles ✓ Give reading assignment	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion ✓ Ask and answering	✓ Understand the concern of mycology and classification of skeletal muscles

4	<ul style="list-style-type: none"> • Muscles of the thoracic limb • Muscles of the pelvic limb <p>5. Celomic cavities and serous membranes</p> <ul style="list-style-type: none"> • Introduction • Thoracic cavity • Abdominal cavity • Pelvic cavity • Serous membranes 	<ul style="list-style-type: none"> ✓ Introducing muscles of limbs ✓ Brainstorming ✓ Introducing the body cavities ✓ Giving reading assignment 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Understand the muscles of the limbs ✓ Describe the body cavities
5	<p>6. The digestive system</p> <ul style="list-style-type: none"> • Introduction • Mouth, tongue and teeth • Pharynx • Esophagus • Stomach • Non-ruminant stomach • Ruminant stomach • Small intestine • Large intestine 	<ul style="list-style-type: none"> ✓ Introduce the the digestive system ✓ Brainstorming ✓ Lecturing on organs of the alimentary canal ✓ Give reading assignment 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Able to describe the digestive system and each organs of the system
6	<ul style="list-style-type: none"> • Accessory digestive organs <ul style="list-style-type: none"> ▪ Salivary glands ▪ Liver 	<ul style="list-style-type: none"> ✓ Lecturing on Accessory digestive organs ✓ Group discussion ✓ Lecture on the 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation 	<ul style="list-style-type: none"> ✓ Understand the accessory digestive organs ✓ Describe the organs of respiratory

7	8. Cardiovascular system <ul style="list-style-type: none"> ▪ Heart and pericardium ▪ Arteries ▪ Veins 	<ul style="list-style-type: none"> ✓ Introducing the cardiovascular system ✓ Group discussion ✓ Introducing the heart ✓ Brainstorming ✓ Introducing the arteries and veins of the body 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Describe the the anatomy of cardiovascular system
8	9. Lymphatic system <ul style="list-style-type: none"> • Lymph nodes • Lymph vessels 	<ul style="list-style-type: none"> ✓ Introducing the chapter ✓ Class discussion ✓ Lecturing on the anatomy of lymph nodes and lymphatic vesseles ✓ Giving reading assignment 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Describe the anatomy of lymphatic system
9	10. Nervous system <ul style="list-style-type: none"> ▪ Central nervous system <ul style="list-style-type: none"> 1.1. Brain 1.2. Spinal cord ▪ Peripheral nervous system 	<ul style="list-style-type: none"> ✓ Introduce the nervous system and anatomy of CNS ✓ Brainstorming ✓ Anatomy of peripheral nervous system ✓ Give reading assignment 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion 	<ul style="list-style-type: none"> ✓ Understand the anatomy of the nervous system

10	11. Endocrine system <ul style="list-style-type: none"> ▪ Pituitary gland ▪ Pineal gland ▪ Thyroid glands ▪ Parathyroid glands ▪ Adrenal glands 	<ul style="list-style-type: none"> ✓ Introducing the Endocrine system ✓ Group discussion ✓ Lecturing on the anatomy of endocrine glands ✓ Giving Reading assignment 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion 	<ul style="list-style-type: none"> ✓ Able to describe the anatomy of Endocrine system
11	12. Urinary system <ul style="list-style-type: none"> ▪ Kidneys ▪ Ureters ▪ Urinary bladder ▪ Urethra in different species of animals 	<ul style="list-style-type: none"> ✓ Introducing the urinary system ✓ Class discussion ✓ Lecture on organs of urinary system ✓ Give reading assignment 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork 	<ul style="list-style-type: none"> ✓ Understand and Describe the anatomy of urinary system
12	13. Reproductive system 13.1 Male reproductive system <ul style="list-style-type: none"> ▪ Scrotum and testis ▪ Epididymis ▪ Vas deference ▪ Penis ▪ Accessory sex glands 	<ul style="list-style-type: none"> ✓ Introducing the reproductive system ✓ Class discussion ✓ Lecture on on the organs of male reproductive system ✓ Giving Reading assignment 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion 	<ul style="list-style-type: none"> ✓ Understand and describe the anatomy of male reproductive system
13	13.2. Female reproductive system <ul style="list-style-type: none"> ▪ Ovary 	<ul style="list-style-type: none"> ✓ Lecture on the anatomy of organs of female reproductive system 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture 	<ul style="list-style-type: none"> ✓ Describe the anatomy of organs of female

14.	14. Sense organs <ul style="list-style-type: none"> ▪ Eye ▪ Ear 15. Common integument and mammary gland <ul style="list-style-type: none"> ▪ Skin and hair ▪ Hoof <p>Mammary glands</p>	<ul style="list-style-type: none"> ✓ Introducing the anatomy of the Eye and Ear ✓ Brainstorming ✓ Lecturing on the anatomy of Integument ✓ Give reading assignment 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion 	<ul style="list-style-type: none"> ✓ Understand the anatomy of Eye and ear ✓ Able to describe the anatomy of common integument and mammary gland
15	16. Avian anatomy	<ul style="list-style-type: none"> ✓ Introducing the avian anatomy ✓ Giving reading assignment 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion 	<ul style="list-style-type: none"> ✓ Understand the unique features of avian anatomy

Final exam

4.2.assessment strategies and techniques and courses policy

Assessment

➤ Quiz	7%
➤ Test.....	8%
➤ Assignment.....	10%
➤ Mid exam.....	25%
➤ Final exam.....	50%
➤ Total	100%

Courses policy

Student has to

- Attend 85% of the class
- take all continuous assessment and mid exam
- Take final exam
- Respect all rules and regulation of the university

Reference

- ✓ Frandeson, R.D., 1980. Anatomy and physiology of domestic animals. 3rd Edition,

Baillere Tindall.

- ✓ Dyce, K.M., Sack. W.O. and Wensing, C.J.K. 1987. Textbook of veterinary anatomy. 3rd Edition, Bailliere Tindall.
- ✓ Bone J.F., 1988: Animal Anatomy and Physiology, 3rd ed.
- ✓ Getty R.,: Sissons and Grossman's The Anatomy of Domestic Animals, Volume I & II.
- ✓ Schummer, A., 1973: The Viscera of the Domestic Mammals, 5th ed.
- ✓ Messonnier, S.P., 2000: Veterinary Neurology. The practical veterinarian

SCHEDULE OF PRACTICAL/ LABORATORY

S e s s i o n	Practical work	Tasks
1	<ul style="list-style-type: none"> • Topographic terms, classification of bones • Terminology of bone structures , regional classification of bones 	Report Writing
2	<ul style="list-style-type: none"> • Axial skeleton • Appendicular skeleton • Joints of skull, vertebral column, ribs and forelimb and hind limb 	Report Writing
3	<ul style="list-style-type: none"> • Demonstration of muscle using models • Dissect animal cadaver to demonstrate fresh muscle 	Report Writing
4	<ul style="list-style-type: none"> • Dissect animal cadaver to demonstrate body cavities, digestive system and respiratory system 	Report Writing
5	<ul style="list-style-type: none"> ▪ Location of heart in live animals <p>Structure of heart and within the thorax Dissect animal cadavers and observe arteries and veins and Demonstrate lymph nodes in different parts of the body</p>	Report Writing

6	<ul style="list-style-type: none"> • Demonstrate CNS and peripheral nervous system using model and pictures • Demonstrate CNS and peripheral nervous system using model and pictures 	Report Writing
7	<ul style="list-style-type: none"> • Urinary system • Male reproductive system 	Report Writing
8	<ul style="list-style-type: none"> • Female reproductive system 	Report Writing
9	<ul style="list-style-type: none"> • Anatomy of sense organ • Anatomy of common integuments 	Report Writing
10	<ul style="list-style-type: none"> • Avian Anatomy 	Report Writing
Approval section		
	Name	Signature
Chair holder		
Department head		

Veterinary Physiology



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary Anatomy and physiology				
Module No.	02				
Course Title	Veterinary Physiology				
Course code	Vtsc-2021				
Credit Hrs/ECTS	Cr Hrs=3	Lecture Hrs=2	Laboratory=1	Home study=7	Cp/ECTS=5
Semester	I				
Year	II				
Pre-requisites	No				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

Lectures: The course deals about the fundamental principles and concepts about the normal functions of major organ systems, which is a basis for understanding the overall function or dysfunction of the body of different animal species. More importantly, the course prepares students with foundation knowledge to pharmacology, medicine, pathophysiology and clinical pathology. The scope of veterinary physiology covers the organization of the body into different systems; Cell function, transport across cell membranes, body fluid compartments, neuromuscular physiology, blood cardiovascular system, respiratory physiology and renal physiology.

Practical: Erythrocyte Fragility test, Erythrocyte and total leukocyte and differential count, determination of PCV, hemoglobin determination, blood coagulation time, bleeding time, blood grouping, ECG in various animals, measurement of heart and respiratory rates and arterial blood pressure, nerve, muscle preparation, simple muscle curve in *in vivo* muscles, stimulation effect of cold, heat and loads effect of fatigue.

3. OBJECTIVES OF THE COURSE

At the end of this course, the students should be able to:

- ✓ Explain the normal functioning of the treated organ systems of the body and their interactions.
- ✓ Narrate the contribution of each organ system to the maintenance of homeostasis.
- ✓ Elucidate the physiological aspects of normal growth and development.
- ✓ Describe the physiological response and adaptations to environmental stresses.

✓ Appreciate the application of the learned material in practical situations and in different disciplines of Veterinary science.

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	1. Chapter 1: General Introduction of physiology 1. General physiology 1.1. Introduction 1.2. Cellular physiology 1.3. Body fluids and transport mechanisms 1.3.1. The body Fluids 1.3.2. Water balance 1.3.3. Cellular Transport Mechanisms 1.3.3.1. Passive transport 1.3.3.2. Active transport	✓ Brainstorming ✓ Define terminology ✓ Provide brief introduction about vet. Physiology	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture	✓ Develops positive attitude towards the courses ✓ Describe cellular physiology, types of transport mechanism and its uses.
2,3	2. Chapter 2 - Homeostasis 2.1. Factors involved in homeostasis 2.2. Mechanism of action of homeostatic control system 2.2.1. Negative feedback mechanism 2.2.2. Positive feedback mechanism 2.3. Acid- Base homeostasis and buffer systems 2.4. Normal PH and hydrogen ion concentration 2.5. Temperature regulation and its mechanisms 2.6. Adjustment to environmental temperatures	✓ Provide brief introduction about homeostasis and its factor involved. ✓ Providing short note	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Able to define homeostasis ✓ Describe different types of homeostasis mechanism, ✓ Understand the different factors involved in homeostasis
4, 5	3. Neuromuscular Physiology 3.1. Neurophysiology 3.1.1. Structure and functional morphology of a neurons 3.1.2. Resting membrane potential 3.1.3. Action Potential	✓ Provide brief lecture on Neurophysiology ✓ Brainstorming ✓ Provide brief	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given	✓ Able to define Neurophysiology ✓ Understand Structure and functional

	<p>3.1.4. Synapse and Synaptic transmission</p> <p>3.1.5. Neurotransmitters and their receptors</p> <p>3.1.6. Defense and alarm reaction</p> <p>3.1.7. Nervous system organization</p> <p>3.1.7.1. Central nervous system</p> <p>3.1.7.2. Peripheral nervous system</p> <p>3.1.7.3. Autonomic nervous system</p> <p>3.1.7.4. Somatic nervous system</p>	<p>discussion and let them know and understand about Structure and functional morphology of neurons</p> <p>✓ Providing short note</p>	<p>lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion</p> <p>✓ Ask and answering</p>	<p>morphology of a neurons</p> <p>✓ Describe Nervous system organization</p>
6	<p>3.2. Muscle Physiology</p> <p>3.2.1. Muscle types</p> <p>3.2.2. Molecular aspects of muscles and contraction mechanism</p> <p>3.2.3. Transmission of Impulses in muscles</p> <p>3.2.4. Relation between contractile force and sarcomere length</p> <p>3.2.5. Load and velocity of shortening</p> <p>3.2.6. Isotonic and isometric contraction</p> <p>3.2.7. Summation</p> <p>3.2.8. Muscle fatigue</p>	<p>✓ Lecture on muscle physiology</p> <p>✓ Brainstorming</p> <p>✓ Identification of Transmission of Impulses in muscles</p> <p>✓ Providing short note</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion</p> <p>✓ Take reading assignment</p> <p>✓ Pear idea sharing</p> <p>✓ Group discussion and classwork</p>	<p>✓ Able to Identify types of muscle</p> <p>✓ Understand the concepts of transmission of Impulses in muscles</p> <p>✓ Identify types of muscle contraction</p>
7,8	<p>4. Cardiovascular physiology</p> <p>4.1. Blood Physiology</p> <p>4.1.1. Blood Composition and Function</p> <p>4.1.1.1. Erythrocyte sedimentation rate and hematocrit</p> <p>4.1.1.2. Immunity and Allergy</p> <p>4.1.1.3. Blood groups</p> <p>4.2. The heart and blood circulation</p> <p>4.2.1. Functional anatomy of the heart</p> <p>4.2.2. Conduction system in cardiac muscles</p>	<p>✓ Introduction to blood physiology</p> <p>✓ Identification of blood composition</p> <p>✓ Lecture on the heart and blood circulation</p> <p>✓ Brainstorming</p> <p>✓ Provide short note</p> <p>✓ Discussion</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion and classwork</p>	<p>✓ Able to understand the physiology of the heart and the blood circulation</p> <p>✓ Identify types of Conduction system in cardiac muscles</p>

	<p>4.2.3. Action potential phases in cardiac muscle cell</p> <p>4.2.4. Electrocardiogram</p> <p>4.2.5. Cardiac cycle</p> <p>4.2.6. Cardiac sounds</p> <p>4.2.7. Cardiac output</p> <p>4.2.8. Cardiac Regulation</p> <p>4.2.9. Pulmonary and systemic circulations</p>	<p>✓ Class work</p>		
9	<p>4.2.10. Hemodynamics</p> <p>4.2.11. Patterns of blood flow</p> <p>4.2.12. Arterial blood pressure</p> <p>4.2.13. Regulation of ABP</p> <p>4.2.14. Capillaries and capillary exchange dynamics</p> <p>4.2.15. Circulatory shock</p> <p>4.2.16. Hypoxia and Anoxia</p>	<p>✓ Define hemodynamics</p> <p>✓ Lecture on Arterial blood pressure and its regulation</p> <p>✓ Brainstorming</p> <p>✓ Provide short note</p> <p>✓ Discussion</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p>	<p>✓ Understand and able to describe Patterns of blood flow</p> <p>✓ Identify types of hemodynamics</p> <p>✓ Describe types of shock</p>
10	<p>5. Lymphatic System and Lymph</p> <p>5.1. Introduction</p> <p>5.2. Anatomy and function of lymph and lymph nodes</p> <p>5.3. Composition, formation and flow of lymph</p> <p>5.4. Reticulo-endothelial system</p>	<p>✓ Introduce Lymphatic System and Lymph</p> <p>✓ Lecture on Anatomy and physiology of lymph nodes</p> <p>✓ Peer idea sharing</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p>	<p>✓ Understand and able to describe the Composition, formation and flow of lymph</p> <p>✓ Describe different types of lymphatic system</p>
11	<p>6. Respiratory system</p> <p>6.1. Introduction</p> <p>6.1.1. Function of the respiratory system</p> <p>6.1.2. Structural Organization</p> <p>6.2. Types of breathing</p> <p>6.3. Pulmonary volumes and capacities</p> <p>6.4. Ventilation</p> <p>6.5. Gas exchange and oxygen transport</p> <p>6.6. Oxygen-Hemoglobin dissociation curve</p>	<p>✓ Provide brief introduction about respiratory system</p> <p>✓ Define terminology</p> <p>✓ Provide short note on physiology of respiratory system</p> <p>✓ Class discussion</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p>	<p>✓ Understand and able to describe the Structural Organization of respiratory system</p> <p>✓ Describe types of breathing</p> <p>✓ Able to describe the state and regulation of</p>

	6.7. Transport of CO2 6.8. States of breathing 6.9. Regulation of respiration 6.10. Hypoxia 6.11. Respiration in Birds			breathing
12	7. Digestive Physiology (Introduction, Oral cavity and its adnexia, Non-ruminant stomach, The ruminant stomach, Digestion and motility in the small intestine, Digestion and absorption in the large intestine)	<ul style="list-style-type: none"> ✓ Lecture on Digestive Physiology ✓ Define terminologies ✓ Class discussion ✓ Brainstorming ✓ Provide short note on the digestive system 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork 	<ul style="list-style-type: none"> ✓ Able to differentiate ruminants and non-ruminant animals ✓ Able to understand Digestion and its process
13	8. Renal physiology (Function of kidneys, Anatomical consideration, Functions of nephron and formation of urine, Mechanisms of urine concentration, Acid base balance, Renal hormone production, Micturition, Avian renal Physiology)	<ul style="list-style-type: none"> ✓ Define renal terminology ✓ Lecture on the function and anatomical consideration of kidneys ✓ Provide short note ✓ Class discussion 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork 	<ul style="list-style-type: none"> ✓ Able to understand Renal physiology ✓ Describe the different types Functions of nephron ✓ Able to understand the difference between mammal and avian renal physiology
14	9. Reproductive Physiology (The biology of sex, The male reproductive system, The female reproductive system)	<ul style="list-style-type: none"> ✓ Lecture on reproductive physiology of animal 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the 	<ul style="list-style-type: none"> ✓ Describe different types of biology of sex

15	10.Endocrinology (Generalities, Chemical classes of hormones, Hormone transport, Mechanisms of hormones action, Functions of hormones, Regulation of hormone secretion, Biologic effects, regulation and abnormalities of hormones of: Hypothalamus and Pituitary gland, Pineal body, Thyroid hormones, Parathyroid glands, Adrenal glands, Endocrine elements of the pancreas)	<input checked="" type="checkbox"/> Lecture on Physiology of endocrine system <input checked="" type="checkbox"/> Define terminologies <input checked="" type="checkbox"/> Class discussion <input checked="" type="checkbox"/> Brainstorming <input checked="" type="checkbox"/> Provide short note on Regulation of hormone secretion	<input checked="" type="checkbox"/> Listen lecture and take notes from the lecture <input checked="" type="checkbox"/> Forward all doubts relation to the given lecture <input checked="" type="checkbox"/> Take reading assignment <input checked="" type="checkbox"/> Group discussion and classwork	<input checked="" type="checkbox"/> Understand and able to describe the physiology of endocrine system <input checked="" type="checkbox"/> Describe the chemical classes of hormones <input checked="" type="checkbox"/> Understand and able to describe the regulation and abnormalities of types of hormones
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16	Final exam
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4.2.assessment strategies and techniques and courses policy

Assessment	
• Quiz	7%
• Test.....	8%
• Assignment.....	10%
• Mid exam.....	25%
• Final exam.....	50%
• Total	100%

Courses policy	
Student has to	
<input checked="" type="checkbox"/>	Attend 85% of the class
<input checked="" type="checkbox"/>	take all continuous assessment and mid exam
<input checked="" type="checkbox"/>	Take final exam
<input checked="" type="checkbox"/>	Respect all rules and regulation of the university

5. REFERENCES

Gyton H. (2006). Text Book Medical Physiology, 11th Edition.
 Reece O. (2004). Functional Anatomy and Physiology of Farm Animals, 3rd Editions Rastogi S. (2004). Essentials of Animal Physiology, 4th Edition
 Kay I. (1998) Introduction to Animal Physiology

6. PRACTICAL/ LABORATORY

Week	Practical work	Tasks	Due date for submission of report
1	Rules and regulation in laboratory and demonstration of laboratory Equipments, their	Report Writing	

	basic functions and handling.		
2	Demonstration of anatomical sites of heart and lung and Measurement of heart and respiratory rates	Report Writing	
3	Demonstration of sites and methods of blood sample collection	Report Writing	
4	Demonstration of steps and methods in Determination of PCV and hemoglobin	Report Writing	
5	Erythrocyte and total leukocyte count	Report Writing	
1 2	Methods of identification of differential leukocyte count	Report Writing	
Approval section			
	Name	Signature	
Chair holder			
Department head			

Veterinary Histology



Bahir Dar University
College Of Agriculture And Environmental Science
School Of Animal Science And Veterinary Medicine

1. Course Information					
Module name	Veterinary Anatomy and physiology				
Module No	02				
Course Title	Veterinary Histology				
Course Code	Vtsc2023				
Credit Hrs./ ECTS	Cr Hrs =3	Lecture Hrs. = 2	Laboratory Hrs. = 1	Home study = 7	CP/ECTS = 5
Semester	I				
Year	II				
Pre-requisites	None				
Target Group	Bachelor Veterinary Science				
Instructor's name and Address:					
Status of the course	Compulsory				
2. Course Description:					
<p>Lectures: Veterinary Histology is a branch of anatomy concerned with the visual examination of cells, intercellular structures as well as their organization in tissues and organs, by means of the microscope and by using appropriate preparations thin enough to transmit light or electrons. Studying the normal microscopic structure of the animal body is the basis for understanding abnormal microscopic lesions (histopathology), body functions, immunology, clinical pathology and several other disciplines in veterinary medicine. Veterinary Histology deals with the techniques of studying cells and tissues, cell biology, the four basic tissues of the body (epithelium, connective tissue, muscle and nervous tissue), endocrine system, digestive system, cardiovascular system, respiratory system, urinary system, male and female reproductive system, and integument and sense organs.</p> <p>Practical: Microscopy, histological technique and study of different basic tissues of the body, study of different histological slides of various systems of the body.</p>					

3. Objective of the course

Upon completing this course, students should be able to:

- ✓ Recognize microscopically the principal cells, cellular organelles and tissues, and their complex organizations and functions in the body
- ✓ Interpret accurately the structural details in histological sections and be aware of morphologic variations among domestic animal species as described in lectures
- ✓ Relate the acquired information on the microscopic structure to function and vice versa, and deduct (postulate) function from a given structure.
- ✓ Use the knowledge gained in this course to explain the normal microscopic appearance of cells and tissues in contrast to abnormal ones due to artifacts (changes by technical errors) and pathological conditions
- ✓ Develop professional attitudes and skills in handling histological preparations and the light microscope

4. Syllabus Components

4.1. Course Contents, Methods & strategies, and learning outcomes

Week	Content & sub-contents	Methods and strategies	Students Task	Learning Outcomes: At the end of this chapter students will be able to:
1	<p>Chapter 1: Introduction to histology and Methods of histology</p> <p>1.1. Concepts of Histology</p> <p>1.2. Relationship with other subjects</p> <p>1.3. Methods of studying live and killed tissues</p> <p>1.4. Microscopy and interpretation</p>	<ul style="list-style-type: none"> • Introduce the concept of veterinary histology • Brainstorming • Asking questions • Providing short note on history of histology and relation with other subjects 	<ul style="list-style-type: none"> ▪ Attend the lesson ▪ Listen the lecture and take notes ▪ Answer questions ▪ Ask and answer questions 	<ul style="list-style-type: none"> ▪ Describe the scope of vet. histology in diagnosing different diseases ▪ Discuss methods of studying living and killed tissue ▪ Discuss the type of microscopes used in Vet. histology

2	<p>Chapter2: Cell biology 2.1. General cellular characteristics 2.2. Structural organization of the cell 2.3. Cell division 2.4. Functional morphology</p>	<ul style="list-style-type: none"> • Introduce the cell theory and structures • Brain storming • Lecture on the cell structures and functions, cellular diversity • Providing short notes on structural components of cell and cell division • Ask questions 	<ul style="list-style-type: none"> ▪ Attend the lesson ▪ Listen and take notes ▪ Answer questions ▪ Peer idea Sharing ▪ Ask and answer questions ▪ laboratory activities to be familiarize with examining cellular structure under microscope 	<ul style="list-style-type: none"> ▪ Describe the major components of cell. ▪ Describe the type of cell division ▪ Discuss the function of each structural components of the cell
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3	<p>Chapter 3: Epithelial tissues 3.3. General characteristics 3.2. Classification of epithelial tissues 3.3. Types and classification of glandular epithelium</p>	<ul style="list-style-type: none"> • Introduce the general characteristics of epithelial tissues • Brain storming • Lecture on the type of epithelial tissue and glandular epithelium • Providing short notes on general features and type of epithelium • Ask questions and facilitate expression of the contents of the chapter 	<ul style="list-style-type: none"> ▪ Attend the lesson ▪ Listen and take notes ▪ Answer questions ▪ Pear idea Sharing ▪ Ask and answer questions ▪ laboratory activities to differentiate the different type of epithelium (mammalian prepared slides) 	<ul style="list-style-type: none"> ▪ Explain general features and type of epithelium ▪ Describe the type and methods of classification of glandular epithelium
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4	<p>Chapter 4. Connective tissue 4.1. General characteristics 4.2. Cells, fibers and ground substances of connective tissue) 4.3. Connective tissue (cartilage & bone) 4.3.1. Cartilage 4.3.2. Bone 4.4. Connective tissue (blood) 4.4.1. Blood cells</p>	<ul style="list-style-type: none"> • Introduce the concept of connective tissue • Brain storming • Lecture on the microscopic components of connective tissues and type of connective tissue • Providing short notes • Ask questions and facilitate expression of the contents of the chapter 	<ul style="list-style-type: none"> ▪ Attend the lesson ▪ Listen and take notes ▪ Answer questions ▪ Peer idea Sharing ▪ Ask and answer questions ▪ laboratory activities to differentiate the different type of connective tissues (mammalian prepared slides) 	<ul style="list-style-type: none"> ▪ List type of connective tissues ▪ Discuss the major components of connective tissue
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5	<p>Chapter 5. Muscle Tissue 5.1. General characteristics 5.2. Smooth muscle 5.3. Skeletal muscle 5.4. Cardiac muscle</p>	<ul style="list-style-type: none"> • Introduce general features of muscle tissues • Brain storming • Group discussion • Lecture on the three major types of muscle tissues and microscopic features of each muscle type 	<ul style="list-style-type: none"> ▪ Attend the lesson ▪ Listen and take notes ▪ Answer questions ▪ Pear idea Sharing ▪ Ask and answer questions ▪ laboratory activities to differentiate the different type of muscle tissues (mammalian prepared slides) 	<ul style="list-style-type: none"> • Explain general features of muscle tissue • Discuss the three major types of muscle tissues
6	<p>Chapter 6: Nervous tissue 6.1. General characteristics 6.2. Neurons 6.3. Synapse 6.4. Neuroglia 6.5 Central nervous tissue 6.6. Peripheral nervous tissue</p>	<ul style="list-style-type: none"> • Introduce the general features of nervous tissue • Brain storming • Group discussion • Lecture on types of nervous tissue and microscopic feature of nervous tissue 	<ul style="list-style-type: none"> ▪ Attend the lesson ▪ Listen and take notes ▪ Answer questions ▪ Pear idea Sharing ▪ Ask and answer questions ▪ laboratory activities to differentiate the different type of nervous tissues (mammalian prepared slides) 	<ul style="list-style-type: none"> • Explain the general features of nervous tissue • Discuss types of nervous tissue and microscopic feature of nervous tissue

7	<p>Chapter 7: Endocrine System</p> <p>7.1 General characteristics</p> <p>7.2 Hypothalamo-hypophyseal system</p> <p>7.3 Pituitary gland</p> <p>7.4 Pineal gland</p> <p>7.5 Thyroid gland</p> <p>7.6 Parathyroid gland</p> <p>7.7 Adrenal gland</p> <p>7.8 Pancreatic islets</p> <p>7.9 Gonadal endocrine cells</p>	<ul style="list-style-type: none"> • Introduce general features of the endocrine system • Brain storming • Group discussion • Providing short notes • Lecture on types of glands and their cellular organization 	<ul style="list-style-type: none"> • Attend the lesson • Listen and take notes • Answer questions • Pear idea Sharing • Ask and answer questions • laboratory activities to differentiate the different type of glands (mammalian prepared slides) 	<ul style="list-style-type: none"> • Explain general features of endocrine system • Describe cellular organizations of each organs of the endocrine system • Discuss the function of glands
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8 & 9	<p>Chapter 8: Digestive system</p> <p>8.1. Introduction</p> <p>8.2. Structures in the oral cavity</p> <p>8.3. Pharynx</p> <p>8.4. Esophagus</p> <p>8.5. Non ruminants stomach</p> <p>8.6. Ruminants stomach</p> <ul style="list-style-type: none"> ✓ Rumen ✓ Reticulum ✓ Omasum ✓ Abomasum <p>8.7. Small Intestine</p> <ul style="list-style-type: none"> ✓ Duodenum ✓ Jejunum ✓ Ileum <p>8.8. Large Intestine</p> <ul style="list-style-type: none"> ✓ Cecum ✓ Colon ✓ Rectum ✓ Anus <p>8.9. Accessory digestive organs</p> <ul style="list-style-type: none"> ✓ Salivary glands ✓ Liver ✓ Pancreas 	<ul style="list-style-type: none"> • Introduce digestive system in monogastric and polygastric animals • Brain storming • Lecture on cellular organizations of each organs of the digestive system • Providing short notes • Promote group discussion 	<ul style="list-style-type: none"> ▪ Attend the lesson ▪ Listen and take notes ▪ Answer questions ▪ Pear idea Sharing ▪ Ask and answer questions ▪ laboratory activities to differentiate the different organs of digestive system (mammalian prepared slides) 	<ul style="list-style-type: none"> • Explain general features of digestive system in monogastric and polygastric animals • Describe cellular organizations of each organs of the digestive system • Discuss the function of each organs of the digestive system
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10	<p>Chapter 9: Cardiovascular system 9.1. Introduction 9.2. Blood vessels 9.3. Heart 9.4. Lymphatic system ✓ Introduction ✓ Lymph vessels ✓ Lymphatic organs</p>	<ul style="list-style-type: none"> • Introduce the general features of cardiovascular system and lymphatic system • Brain storming • Group discussion • Lecture on cellular organization blood vessels, heart, lymphatic vessels and lymphatic organs 	<ul style="list-style-type: none"> • Attend the lesson • Listen and take notes • Answer questions • Peer idea Sharing • Ask and answer questions • laboratory activities to differentiate the different types of blood and lymphatic vessels, heart and lymphatic organs (mammalian prepared slides) 	<ul style="list-style-type: none"> • Explain general features and function of blood and lymphatic vessels • Describe cellular organizations of each organs and vessels of the cardiovascular system • Discuss the function of heart and lymphatic organs
11	<p>Chapter 10: Respiratory system 10.1. Introduction 10.2. Nasal cavity and associated structures 10.3. Nasopharynx 10.4. Larynx 10.5. Trachea & bronchi 10.6. Lung</p>	<ul style="list-style-type: none"> • Introduce general features of the respiratory system • Brain storming • Group discussion • Providing short notes • Lecture on cellular organizations of each organs of the respiratory system 	<ul style="list-style-type: none"> • Attend the lesson • Listen and take notes • Answer questions • Peer idea Sharing • Ask and answer questions • laboratory activities to differentiate the different organs of the respiratory system (mammalian prepared slides) 	<ul style="list-style-type: none"> • Explain general features of the respiratory system • Describe cellular organizations of each organs of the respiratory system • Discuss the function of different organs of the respiratory system

12	<p>Chapter 11: Urinary system 11.1. Introduction 11.2. Kidneys 11.3. Ureters 11.4. Urinary bladder and Urethra</p>	<ul style="list-style-type: none"> • Introduce general features of the urinary system • Brain storming • Group discussion • Providing short notes • Lecture on cellular organizations of each organs of the urinary system 	<ul style="list-style-type: none"> • Attend the lesson • Listen and take notes • Answer questions • Pear idea Sharing • Ask and answer questions • laboratory activities to differentiate the different organs of the urinary system (mammalian prepared slides) 	<ul style="list-style-type: none"> • Explain general features of the urinary system • Describe cellular organizations of each organs of the urinary system • Discuss the function of different organs of the urinary system
13 & 14	<p>Chapter 12: Male and Female reproductive system 12.1. Introduction Male reproductive system 12.2. Testis & its associated structures 12.3. Epididymis 12.4. Ductus deferens 12.5. Accessory glands 12.6. Penis and prepuce Female reproductive system 12.7. Ovary 12.8. Oviduct 12.9. Uterus 12.10. Cervix 12.11. Vagina 12.12. Vestibule, Clitoris & Vulva 12.13. Mammary glands</p>	<ul style="list-style-type: none"> • Introduce general features of male and female reproductive system • Brain storming • Group discussion • Providing short notes • Lecture on cellular organizations of each organs of male and female reproductive system 	<ul style="list-style-type: none"> • Attend the lesson • Listen and take notes • Answer questions • Pear idea Sharing • Ask and answer questions • laboratory activities to differentiate the different organs of male and female reproductive system (mammalian prepared slides) 	<ul style="list-style-type: none"> • Explain general features of male and female reproductive system • Describe cellular organizations of each organs of male and female system • Discuss the function of different organs of male and female reproductive system

15	<p>Chapter 13: Integument & sense organs</p> <p>13.1. Skin and skin appendages</p> <p>13.2. Hoof & claws</p> <p>13.3. Horns</p> <p>13.4. Eye and ear</p>	<ul style="list-style-type: none"> • Introduce general features of integument and sense organs • Brain storming • Group discussion • Providing short notes • Lecture cellular organizations of integument and sense organs 	<ul style="list-style-type: none"> • Attend the lesson • Listen and take notes • Answer questions • Peer idea Sharing • Ask and answer questions • laboratory activities to differentiate the different organs of integument and sensory system (mammalian prepared slides) 	<ul style="list-style-type: none"> • Explain general features of integument and sense organs • Describe cellular organizations of integument and sense organs • Discuss the function of different organs of integument and sensory system
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16	Final exam			
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4.2. Assessment Strategies & Techniques and Course Policy

Assessment	
• Test.....	8%
• Quiz.....	7%
• Lab exam	9%
• Mid.....	25%.
• Final Exam	50%
Total.....	100%

<p>Course policy</p> <p>A student has to:</p> <ul style="list-style-type: none"> - Attend at least 85% of the classes. - Take all continuous assessments and mid Exam. - Take final examination. - Respect all rules & regulations of the university.

<p><u>REQUIRED REFERENCE BOOKS</u></p> <p>1. Don A. Samuelson (2007): Textbook of Veterinary Histology, 1st edition</p> <p>2. William J. Banks (1993): Applied Veterinary Histology, 3rd edition</p> <p>3. Inderbir Singh (2004): Text book of Human Histology with Color Atlas, 5th edition</p> <p>4. Luiz C. Junqueira and Jose Carneiro (2005): Basic Histology, 11th edition</p>
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5. Glauca M. and Machado-Santelli (2004): Histology: A Color Atlas (Image in Focus)

6. Finn Geneser (2005): Color Atlas of Histology

7. JP Gunasegaran (2007): Textbook of Histology and a Practical Guide

Proposed lab. Activities for Veterinary Histology (Vtsc2023)

Session 1. Type of Microscope and Preliminary use of the microscope

Session 2. Epithelial tissue in different organs of animals

Session 3. Connective tissues

Session 4. Muscle tissues

Session 5. Nervous tissues

Session 6. Endocrine system

Session 7-9. Digestive system

Session 10. Cardiovascular system

Session 11. Respiratory system

Session 12. Urinary system

Session 13-14. Male and Female reproductive system

Session 15. Integument and sense organ

Approval section

	Name	Signature	Date
Chair Holder's			
Department Head's			

Veterinary Embryology



Bahir Dar University
College of Agriculture and Environmental Science
School of Animal Science and Veterinary Medicine

3. Course Information

Module Name	Veterinary Anatomy and physiology
Module No.	02
Course Title	Veterinary Embryology
Course code	Vtsc2024
Credit Hrs/ECTS	Cr Hrs = 1, Lecture Hr = 1, Laboratory =0, Home study =3, Cp/ECTS=2
Semester	I
Year	II
Pre-requisites	No
Target group	Bachelor Veterinary Science
Status	Compulsory
Instructor name and address	

4. Course Description:

The course of veterinary embryology deals with the study of developmental structure and mechanisms of the body of animals. Where it deals embryonic origin of each organs and it is a basis for understanding histology, gross anatomy, physiology etc.

Lecture: Includes introduction to Embryology, brief description of reproductive organs and process of gametogenesis, early embryonic development, organ differentiation, type of placenta and comparative placentation and finally embryology of bird. Also, some basic principles of teratology related to embryogenesis are studied.

Practical: Study on different developmental stages of fertilized chicken egg. Examination of normal structure of bull sperm cells and cow eggs at different stages of development will be undertaken. Observation of different embryonic and fetal developmental stages in different species using aborted fetuses or specimens collected from abattoirs. Observations on fetal membranes of chicken and mammals are also included.

3.Objectives of the Course:

At the end of the course student should able to:

- ✓ Possess an in-depth knowledge about growth and differentiation of an organism from a single fertilized egg cell (zygote) into highly complex and independent being like its parents.
- ✓ Be able to differentiate different stages of development during specimen examination
- ✓ Appreciate the application of the learned material in practical situations and in different disciplines of Veterinary Science

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Contents and sub-contents	Methods, strategies	Student tasks	Learning Objective
1	Introduction 1.1. Definition and theories 1.2. Reproductive organs	- Brainstorming - Introduce the course and d/t types of reproductive organs	✓ Listen the lecture and take notes from lecture ✓ Forward all the confusion or doubts in relation to the given lecture	✓ Develops positive attitude towards the courses
2	Gametogenesis 1.3. Spermatogenesis	Provide brief introduction about gametogenesis ✓ Spermatogenesis	Listen the lecture and take notes from the lecture Forward all the confusion or doubts in relation to the given lecture	Understand about gametogenesis Able to describe about spermatogenesis
3	1.4. Oogenesis and ovulation 1.4.1. Oogenesis 1.4.2. Ovulation 1.4.3. Types of eggs 1.4.4. Accessory coverings of eggs	Lecture on Oogenesis and ovulation ✓ Providing short note	Listen the lecture and take notes from the lecture Forward all the confusion or doubts in relation to the given lecture Take part on reading assignment	Understand about Oogenesis and ovulation

4	Fertilization 1.5. Union of gametes 1.6. Types of zygotes 1.7. Twin formation	Provide brief lecture about fertilization	Listen the lecture and take ✓ notes from the lecture Forward all the confusion or doubts in relation to the given lecture Take part on reading assignment	Understand and describe about fertilization
5	Fundamental processes and concepts in development 1.8. Intracellular synthesis and cell division 1.9. Cell surface and cell adhesion molecules 1.10. Gene activation - 1.11. Restriction and determination	Lecture on the fundamental processes and concepts in development	Listen the lecture and take ✓ notes from the lecture Forward all the confusion or ✓ doubts in relation to the given lecture Take part on reading assignment	Able to describe and understand about the fundamental processes and concepts in development
6	1.12. Differentiation 1.13. Induction 1.14. Cell movement and intercellular communication 1.15. Cell death Basic embryologic phenomena in mammals Cleavage and segmentation Gastrulation	- Brainstorming about the last topic Lecture on Basic embryologic phenomena in mammals	Listen the lecture and take notes from the lecture ✓ Forward all the confusion or doubts in relation to the given lecture ✓ Take part on reading assignment ✓	Able to describe and understand about basic embryologic phenomena in mammals
7	Fate of the germ layers and tabulation	Lecture on the Fate of the germ layers and tabulation Provide lecture notes	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion or ✓ doubts in relation to the given lecture ✓ Take part on reading	Understand and able to describe the Fate of the germ layers and tabulation

			assignment	
8-9	Definitive Morphogenesis (Organogenesis)	Provide brief introduction to Definitive Morphogenesis	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion or doubts in relation to the given lecture Take part on reading assignment 	Able to describe and understand Definitive Morphogenesis (Organogenesis)
10	Placentation in mammals	Brainstorming Provide brief introduction to Placentation in mammals	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion or doubts in relation to the given lecture 	Able to describe and understand Placentation in mammals
11	Embryology of birds, introduction and general characteristics of poultry	Provide brief lecture on Embryology of birds, introduction and general characteristics of poultry	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion or doubts in relation to the given lecture 	Understand Embryology of birds
12-13	basic physiological difference of birds zygote	Provide lecture on basic physiological difference of birds zygote	<ul style="list-style-type: none"> take notes from the lecture ✓ Forward all the confusion or doubts in relation to the given lecture Take part on reading assignment 	Understand and able to describe basic physiological difference of birds zygote

14-15	Primordial Morphogenesis Secondary Morphogenesis Definitive Morphogenesis	Brainstorming Provide brief lecture on -Primordial Morphogenesis -Secondary Morphogenesis -Definitive Morphogenesis	✓ Listen the lecture and take notes from the lecture Forward all the confusion or doubts in relation to the given lecture ✓ Take part on reading ✓ assignment	Describe different types of morphogenesis
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16 **Final exam**

4.2. Assessment strategies and techniques and courses policy

Assessment

• Quiz	7%
• Test.....	8%
• Assignment.....	10%
• Mid exam.....	25%
• Final exam.....	50%
• Total	100%

Courses policy
Student has to

- Attend 85% of the class
- take all continuous assessment and mid exam
- Take final exam
- Respect all rules and regulation of the university

Reference books

- Verma, P.S., V.K. Agarwal, B.S. Tyagi 1983. Chordate Embryology 5th edition. S.Chad & Company ltd, New Delhi.
- Carlos, B.M. 1988. Pattern's foundations of Embryology, 5th edition McGraw-Hill

Approval section _____

	Name	Signature
Chair holder		
Department head		

Veterinary Parasitology



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Animal disease agents and immunity				
Module No.	08				
Course Title	Veterinary Parasitology				
Course code	Vtsc2031				
Credit Hrs/ECTS	Cr Hrs=4	Lecture Hrs=3	Laboratory=2	Home study=9	Cp/ECTS=7
Semester	II				
Year	II				
Pre-requisites	No				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

Lecture: Introduction to Parasitology, Basic Terminologies, Effects of Parasites on their host and their economic significance, Types of parasitism, host and organ specificity, parasitic life cycle; Nomenclature and classification of parasites, immunity and resistance Helminthology: Introduction, classification, morphology, life cycle, pathogenesis, clinical signs, epidemiology, diagnosis, treatment, control and or prevention of helminth parasites of veterinary and public health importance. Importance of chemotherapy in relation to helminth control program, anthelmintic medication and issues related to anthelmintic resistance.

Introduction to protozoology, classification, morphology, life cycle, pathogenesis, epidemiology, diagnosis and control measures of the economically important protozoan parasites. Discussions on protozoan zoonosis and Introduction to arthropods and their economic significance; classification, structures and functions. The

morphology, lifecycle, vector role and control of the different species of Insects and arachnids will be studied.
Practical Demonstration of equipment used in parasitology laboratory. Preparation of solutions used for parasitological examinations, Methods of collection, preservation, and transportation of samples, Techniques of microscopic measurements used in Parasitology, Techniques for detecting the presence and determining the level of eggs or larvae of various helminth and protozoa parasites of animals, Identification of important members of class Nematoda, Trematoda, Cestoda Acanthocephala and protozoan parasites. Collection and preparation of blood smears, staining and examination of slides for detecting hemo-parasites. Post-mortem worm counting techniques, Methods for collection, fixation and preservation of arthropod parasites.
 Identification of important members of the order Phthiraptera, Siphonaptera, Hemiptera, Diptera and Acarina.
 Examination of skin scrapings for mange mites; identification of dipteran larvae;

3.Objectives of the Courses

At the end of the course student should able to:

- ✓ Understand the concepts of symbiosis and parasitism and principles of pathogenicity of parasitic infections
- ✓ Know the life-cycle, mode of infection, epidemiology, pathogenesis and major significance of helminth parasites of domestic animals and the immunological response of the host
- ✓ Be familiar with the mode of action of anthelmintic drugs, their spectrum of activity and use in control of parasitic helminth infections
- ✓ Possess skills in techniques of helminth parasite recovery and identification
- ✓ Predict the impact of parasitism on animal production
- ✓ Understand the biology, significance and occurrence of arthropods and protozoan parasites of domestic animals.
- ✓ Possess skills in identification, diagnosis and control of arthropod and protozoan parasites of domestic animals.

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1	Chapter 1 1. Introduction 1.1. Definition of terminologies & concepts 1.2. Types of associations 1.3. Host-parasite relationships 1.4. Types of parasite and host 1.5. Types of life cycle 1.6. Effect of parasites on their hosts 1.7. Immunity and resistance to parasites 1.8. Nomenclature of parasites	<ul style="list-style-type: none"> ✓ Brainstorming ✓ Introduce vet. Parasitology ✓ Define terminologies ✓ Lecture on Host parasite relationships 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture 	<ul style="list-style-type: none"> ✓ Develops positive attitude towards the courses ✓ Describe different types of association ✓ Able to understand about host parasite relationship

2,3,4 5,6	Chapter 2: 2. Helminthology 2.1. General Features of helminthes ▪ Classification: Phylum ▪ Nematelminthes ▪ Platyhelminthes ▪ Acanthocephala Phylum Nematelminthes; Class Nematoda General features, ▪ Morphology, ▪ Reproductions and life cycle ▪ Classification	✓ Provide brief introduction to helminthology ✓ Brainstorming ✓ Lecture on General Features of helminthes ✓ Providing short note on General features of Class Nematoda	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Able to classify and describe helminth parasites ✓ Able to describe and understand the general features of different class of helminth parasites
	Superfamily 2.2. Trychostrongyloidea 2.3. Strongyloidea; 2.4. Metstrongyloidea; 2.5. Ascaridoidea; 2.6. Rhabditoidea; 2.7. Anchylstomatidea; 2.8. Oxyuridea; 2.9. Spiruoidea 2.10. Filarioidea 2.11. Trichuroidea 2.12. Dictophymatoidea	✓ Lecture on General Features of the superfamily of nematodes ✓ Providing short note on General features of superfamily	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion ✓ Ask and answering	✓ Able to understand the general features of superfamily of class nematodes

7	Phylum Platyhelminthes 3. Class Trematoda General features, <ul style="list-style-type: none"> ▪ Morphology, ▪ Reproductions and life cycle ▪ Classification 3.1. Fasciolidae 3.2. Dicrocoelidae 3.3. Paramphistomidae 3.4. Schistosomatidae	✓ Provide brief introduction about the general features and Morphology of Phylum Platyhelminthes, ✓ Brainstorming ✓ Lecture on Class trematode ✓ Providing short note on general features of class trematode	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion ✓ Ask and answering	✓ Understand general features and morphology of Phylum Platyhelminthes ✓ Able to differentiate class trematode from other parasites
8	4. Class Cestodes 4.1. Taenidae 4.2. Anoplocephalidae 4.3. Dilepididae 4.4. Davaineidae 4.5. Hymenolepidae 4.6. Mesocestoidae 4.7. Thysanosomidae 4.8. Pseudophyllidae 4.9. Others: Acanthocephala, Annelida – Hirudinea (Leeches)	✓ Lecture on class cestodes ✓ Brainstorming ✓ Providing short note	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment ✓ Peer idea sharing	✓ Able to describe and understand the general features and morphology of class cestodes
9	Chapter 3. Anthelmintics: Principles of treatment, use, control and the issue of anthelmintic resistance	✓ Provide a brief Introduction about anthelmintics ✓ Brainstorming ✓ Provide short note ✓ Discussion ✓ Class work	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	✓ Able to list the different types of anthelmintics ✓ Able to identify the use of anthelmintics

10	Chapter 4. Protozoology 4.1. Introduction 4.2. Sarcodina (Entamoeba) 4.2.1. Sarcomastigophora ➤ Trypanosoma, ➤ Leishmania ➤ Trichomonas ➤ Giardia ➤ Hexamita	✓ Define Protozoology ✓ Provide a brief introduction about the History and development of protozoology ✓ Lecture on classification of protozoology ✓ Brainstorming ✓ Provide short note ✓ Discussion	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	✓ Able to understand and describe the general features of protozoa ✓ Able to identify the different classes of protozoa
11	4.3. Sporozoa (Coccidia) ➤ Cryptosporidium ➤ Eimeria Isospora ➤ Toxoplasma ➤ Sarcocystis ➤ Besnoitia 4.4. Piroplasma ➤ Babesia ➤ Theiliraia 4.5. Ciliophora ➤ Balantidium 4.6. Microspora ➤ Encephalitozoon	✓ Brief discussion on class sporozoa ✓ Lecture on general morphological features on sporozoa, piroplasma, ciliophora and microspora ✓ Pear idea sharing	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	✓ Able to understand and Describe the general features of classes of protozoa
12	Chapter 5: Veterinary Acarology & Entomology 5.1. Introduction 5.2. General characteristics and classification 5.3. Acarina 5.3.1. Ticks 5.3.2. Mites	✓ Brainstorming ✓ Define terminologies ✓ Lecture on acarology and entomology general features ✓ Provide short note	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	✓ Able to understand and Describe the morphological structures of ticks and mites

		✓ Class discussion		
13	5.4. Phthiraptera 5.4.1. Anoplura 5.4.2. Mallophaga 5.4.3. Siphonaptera	✓ Brief introduction about Phthiraptera ✓ Brainstorming ✓ Lecture on different types Phthiraptera with their general features	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork	✓ Describe and identify the different classes of Phthiraptera
14	5.5. Diptera 5.5.1. Ceratopogonidae 5.5.2. Simulidae 5.5.3. Psychodidae 5.5.4. Culicidae	✓ Lecture on class Diptera ✓ Class discussion ✓ Brainstorming	✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork	✓ Able to Describe and understand the general features of class diptera
15	5.5.5. Tabanidae 5.5.6. Muscidae 5.5.7. Calliphoridae 5.5.8. Sarcophagidae 5.5.9. Oestridae 5.5.10. Hipoboscidae	✓ Lecture on classification of class diptera ✓ Class discussion ✓ Brainstorming	✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading	✓ Able to identify the different types of class diptera

			assignment	
			✓ Group discussion and classwork	

16

Final exam

4.2.assessment strategies and techniques and courses policy

Assessment

- Quiz7%
- Test.....8%
- Assignment.....10%
- Mid exam.....25%
- Final exam.....50%
- Total100%

Courses policy

Student has to

- Attend 85% of the class
- take all continuous assessment and mid exam
- Take final exam
- Respect all rules and regulation of the university

References

1. Urquhart, G. M., Armour, J., Duncan, J. L., Dunn, A. M., and Jennings, F. W.(2001). Long Man, UK Veterinary Parasitology
2. Dunn, A. M. (1986). Veterinary Helminthology, 2nd ed.
3. Hansen, J. and Perry, B. (1994). The Epidemiology, Diagnosis and Control of Helminth Parasites of Ruminants
4. Tibor Kassai (1999):Veterinary Helminthology, 1st ed. Elsevier publishers group.
5. Foreyt, W.J. 2001. Veterinary Parasitology. Reference Manual, 5th edition.
6. Kassir Tibor, 1999. Veterinary Helminthology.
7. Manual of Veterinary Parasitology Laboratory Techniques. Technical Bulletin, No. 18, 1979, MAFF, London
8. Rothman, K.J. and Greenland, S. (1998). Modern Epidemiology. 2nd ed. Lippincott-Raven Publishers, PA.
9. Thrusfield, M. (1995). Veterinary Epidemiology. 2nd ed. Butterworths London.
10. Hendrix, C. M. (1997).Diagnostic Veterinary Parasitology, 2nd ed

5. PRACTICAL/ LABORATORY

Week	Practical work	Tasks	Due date for submission of report
1	Orientation on laboratory precautions, Demonstration of laboratory instrument and equipment used in parasitology laboratory.	Report Writing	
2.	Preparation, principles and application of solutions used for parasitological examinations	>>	
3.	Principles and applications of flotation technique, Principles and applications of sedimentation technique, Baerman technique and larval identification	>>	
4.	Methods of collection, preservation, and transportation of samples, direct faecal smear preparation and examination	>>	
5.	Collection and gross examination of parasites, Morphology identification of eggs and adult parasite	>>	
6.	Gross and microscopic examination and recognition of Nematodes, trematodes and cestodes	>>	
7.	Techniques for detecting the presence and determining the level of eggs or larvae of various helminth parasites of animals.	>>	
8	Post-mortem examination techniques.	>>	
9	Examination of faecal materials for identification of intestinal protozoa.	>>	
10	Collection and preparation of blood smears, staining and examination of slides for detecting haemoparasites.	>>	
11	Identification of important members of protozoan parasites	>>	
12.	Methods for collection, fixation and preservation of arthropod parasites.	>>	
13.	Identification of important members of the order Phthiraptera, Siphonaptera, Hemiptera, Diptera and Acarina.	>>	
14.	Examination of skin scrapings for mange mites; identification of dipteran larvae		

15.	Visits to livestock and poultry farms and research centres for studies of trypanosomes, Tsetse flies, and ectoparasites etc.		
Approval section			
	Name	Signature	
Chair holder			
Department head			

Veterinary Microbiology



Bahir Dar University
College of Agriculture and Environmental Science
School of Animal Science and Veterinary Medicine

5. Course Information

Module Name	Animal Disease Agents and Immunity
Module No.	03
Course Title	Veterinary Microbiology
Course code	Vtsc2032
Credit Hrs/ECTS	Cr Hrs = 4, Lecture Hr = 3, Laboratory =2, Home study =9, Cp/ECTS=7
Semester	II
Year	II
Pre-requisites	No
Target group	Bachelor Veterinary Science
Status	Compulsory
Instructor name and address	

6. Course Description:

Lecture: Definition and branches of Microbiology, historical developments. Prokaryotes versus eukaryotes. Bacterial morphology: shape, size, arrangement and differential staining. General plan of the bacterial cell; nuclear apparatus, bacterial cytoplasm, intracellular granules; cell wall and membrane, capsule, endospore, flagella, fimbriae, etc. Physico- chemical requirements for bacterial growth and multiplication; PH, temperature, oxidation reduction potential, gaseous and nutritional requirements, etc. Types of culture media; Bacterial multiplication and growth curves. Bacterial genetics, antimicrobials and their mode of action, Nomenclature and classification of bacteria. Morphology, cultural characteristics, biochemical activities, resistance to physico-chemical agents, antigenic properties, toxins, association with animal diseases, diagnosis and immuno-prophylaxis of bacteria of veterinary importance. General characteristics and classification of fungi, natural habitat, disease association and laboratory diagnosis of Dermatophytes, Pathogenic yeasts and Dimorphic fungi. Mycotoxins and mycotoxicoses.

Definition and history of virology; general properties of viruses, morphology and composition of viruses, taxonomy and nomenclature of viruses, Virus replication, Viral genetics, methods of viral propagation and Laboratory diagnosis of viral infections. Morphology, cultivation, physico-chemical characteristics, isolation and identification, immunity and disease association of RNA and DNA viruses of veterinary importance. Prions and viroids.

Practical: Safety in the microbiological laboratory, demonstration of laboratory equipments. Microscope and microscopy. Sterilization and disinfection. Bacteriological media preparation and demonstration of various culture media. Methods of bacterial cultivation. Studying bacterial colonies (types and characteristics). Stains and staining: Simple, differential and special. Collection, preservation and submission of material/samples for laboratory diagnosis of bacterial infections. Primary identification, secondary biochemical test and antibiotic sensitivity testing.

Familiarization of virology laboratory, demonstration of agglutination tests, cultivation of viruses; a study tour to Diagnostic/Research laboratories for practical demonstration of cell culture techniques, embryonated egg inoculation and serological tests.

3.Objectives of the Courses

At the end of the course student should able to:

- Describe general features of pathogenic bacteria and fungi
- Identify laboratory hazards and strictly follow laboratory safety guidelines/bio-security protocols, and conduct the respective procedures effectively
- Identify pathogenic bacteria of veterinary importance
- Describe specific features of pathogenic bacteria and fungi
- Acquire comprehensive knowledge of major bacterial and fungal diseases of domestic and wildlife animals
- Select, collect, transport and preserve samples so as to diagnose and treat specific animal diseases of bacterial and fungal origin
- Carry out independently laboratory works like biochemical tests, gram reactions, inoculation, isolation and identification techniques and become capable of interpreting laboratory findings
- Conduct laboratory diagnosis of specific animal diseases of bacterial and fungal infections with sound recommendations
- be familiar with general characteristics and classification of viruses of veterinary importance
- be familiar with different serological tests
- Describe viral family grouped under DNA&RNA viruses and about prions
- Discuss animal diseases which are caused by DNA, RNA Virus and Prions
- Understand the disease processes which is caused by DNA, RNA virus & prions
- Obtain comprehensive knowledge of major viral diseases of domestic and wildlife animals
- Understand the effect of the viral disease on animals and the means to control it.
- Identify the common viral diseases communicable to human

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Contents and sub-contents	Methods, strategies	Student tasks	Learning Objective
1	Chapter 1: Introduction 1.3. Historical development of Microbiology 1.4. Microscopy and Microorganisms	- Brainstorming - Introduce History and development of vet Microbiology	✓ Listen the lecture and take notes from lecture ✓ Forward all the confusion or doubts in relation to the given lecture	✓ Develops positive attitude towards the courses Describe scopes and History of Microbiology

2	Chapter 2: General Bacteriology 2.1. Morphology and structure of bacteria 2.2. Physiology and growth of bacteria	Provide brief introduction to Bacterial morphology and growth physiology	Listen the lecture and take ✓ notes from the lecture Forward all the confusion or ✓ doubts in relation to the given ✓ lecture Take part on reading ✓ assignment	✓ Describe different types bacterial morphology ✓ Understand Bacterial morphology and growth physiology
3	2.3. Microbial genetics and variation	✓ Lecture on Bacterial Genetics ✓ Providing short note	Listen the lecture and take notes from the lecture Forward all the confusion or ✓ doubts in relation to the given lecture Take part on reading assignment	Understand bacterial genetics and variation
4	2.4 Nomenclature and classification of bacteria	Provide brief lecture on bacterial classification	Listen the lecture and take ✓ notes from the lecture Forward all the confusion or doubts in relation to the given lecture Take part on reading assignment	Understand bacterial classification systems and their nomenclature
5	Chapter 3: Systematic Bacteriology 3.1. Gram positive Bacteria - Streptococci - Staphylococci - Bacillus - Clostridium - Acid fast bacilli - Actinomycetes:	Let them to know and understand Gram positive bacteria	Listen the lecture and take ✓ notes from the lecture Forward all the confusion or ✓ doubts in relation to the given ✓ lecture Take part on reading assignment	Able to describe and understand gram positive bacteria
6	3.2 Gram negative Bacteria: - Enterobacteriaceae (Salmonella, E. coli...) - Other Gram negative (Pasteurella, Brucella, Actinobacillus Burkholderia Campylobacter Pseudomonas...)	Let them to know and understand Gram negative bacteria	Listen the lecture and take notes from the lecture ✓ Forward all the confusion or doubts in relation to the given lecture ✓ Take part on reading assignment	Able to describe and understand gram negative bacteria

7	Chapter 4: Mycoplasma, Rickettsia and Chlamydia	Introduce intracellular bacteria, Provide lecture notes	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion or ✓ doubts in relation to the given lecture ✓ Take part on reading assignment 	Understand and able to describe intracellular bacteria
8	Chapter 5: 5. Mycology 5.1. Structure and classification of fungi 5.2. Dermatophytes	Provide brief introduction to Mycology, fungal classification Lecture notes	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion or ✓ doubts in relation to the given lecture ✓ Take part on reading assignment 	Able to describe and understand Fungi and their classifications Understand and able to describe dermatophytes
9	5.3. Pathogenic - Dimorphic Fungi 5.4. Fungal Disease of Veterinary Importance	Provide lecture to let them know and understand pathogenic fungi and disease	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion or ✓ doubts in relation to the given lecture ✓ Take part on reading assignment 	Describe and understand pathogenic fungi and associated disease
	5.5. Mycotoxicosis	Provide brief introduction to Mycotoxicosis Provide lecture notes	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion or ✓ doubts in relation to the given lecture 	Understand and able to describe veterinary important mycotoxins
10	6. Chapter 6: General Virology 6.1. History and Development of Virology 6.2. General characteristics and morphology of viruses	Brainstorming Provide brief introduction to History, development of vet Virology & morphology	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion or doubts in relation to the given lecture 	Able to describe and understand History, development & morphology of viruses
11	6.3 Viral taxonomy and nomenclature 6.4 Viral replication 6.5 Viral genetics	Provide brief lecture on Viral classification, replication and genetics	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion or doubts in relation to the given lecture 	Understand Viral classification systems and their nomenclature, genetics

12	6.6. Cultivation of viruses 6.7. Laboratory diagnosis of viral infections	Provide lecture notes and let them know and understand cultivation of virus and viral disease diagnosis	take notes from the lecture ✓ Forward all the confusion or doubts in relation to the given lecture Take part on reading assignment	Understand and able to describe viral cultivation methods and diagnosis
13	Chapter 7: Systematic Virology 7.1. DNA viruses: 7.1.1. Adenoviridae	Brainstorming Provide brief introduction to DNA viruses	✓ Listen the lecture and take notes from the lecture Forward all the confusion or doubts in relation to the given lecture Take part on reading assignment	Describe DNA viruses and associated diseases
	7.1.2 Herpesviridae 7.1.3 Papillomaviridae 7.1.4 Parvoviridae 7.1.5 Poxviridae	Brainstorming Provide brief introduction to DNA viruses	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion or doubts in relation to the given lecture ✓ Take part on reading assignment	Describe DNA viruses and associated diseases
14	2.2. RNA viruses: 2.2.1 Coronaviridae 2.2.7. Orthomyxoviridae 2.2.8. Paramyxoviridae	Brainstorming Provide brief introduction to RNA viruses	✓ Listen the lecture and take notes from the lecture Forward all the confusion or doubts in relation to the given lecture ✓ Take part on reading assignment	Describe RNA viruses and associated diseases
	2.2.9. Picornaviridae 2.2.11. Retroviridae 2.2.12. Reoviridae 2.2.13. Rhabdoviridae	Brainstorming Provide brief introduction to RNA viruses	✓ Listen the lecture and take notes from the lecture Forward all the confusion or doubts in relation to the given lecture ✓ Take part on reading assignment	Describe RNA viruses and associated diseases
15	7.1.2. 3. Prions: Unconventional infectious agents	Provide lecture notes and let them know and understand prions	Listen the lecture and take notes from the lecture Forward all the confusion or doubts in relation to the given lecture Take part on reading assignment	Understand and able to describe Prions and associated diseases
16	Final exam			

4.2. Assessment strategies and techniques and courses policy

Assessment	
✓ Quiz	7%
✓ Test.....	8%
✓ Assignment.....	10%
✓ Mid exam.....	25%
✓ Final exam.....	50%
✓ Total	100%

Courses policy	
0. Student has to	
✓ Attend 85% of the class	
✓ take all continuous assessment and mid exam	
✓ Take final exam	
✓ Respect all rules and regulation of the university	

4. Reference books

1. Buxton and Fraser (1977): Animal Microbiology, Volume 2.
2. Davis, Dulbecco, Eisen and Ginsberg (1990): Microbiology 4th ed.
3. Fenner, Gibbs, Murphy, Rott, Student and White (1993): Veterinary Virology, 2nd ed.
4. Freeman, B.A. (1979): Textbook of Microbiology, 21st ed.
5. Merchant, I.A. (1983): Veterinary Bacteriology and Virology, 7th ed.
6. Stanier, Ingraham, Wheelis, and Painter (1986): General Microbiology, 5th ed.
7. Fenner, F. J.; Gibbs, E. P. J.; Murphy, F. A.; Rott, R.; Studdert, M. J. and White, D. O. 1993. Veterinary Virology, 2nd edition. Academic Press, Inc.
8. Murphy, F. A, Gibbs, E. P. J, Horzinek, M. C. and Studdert, M. J. 1999. Veterinary Virology, 3rd edition, Academic Press.
9. Hirsh, D. C. and Zee, Y. N. 1999. Veterinary microbiology, Blackwell Science Inc.
10. Quinn, P. J.; Markey, B. K.; Carter, M. E.; Donnelly, W. J. C. ; Leonard, F. C. and Maguire, D. 2002. Veterinary Microbiology and Microbial Disease, Blackwell Science Inc.
11. Quinn, Carter, Markey and Carter, G.R. 1999. Clinical Veterinary Microbiology

5. PRACTICAL/ LABORATORY

Week	Practical work	Tasks	Due date for submission of report
1	Safety in the microbiological laboratory.	Report Writing	
2	Demonstration of laboratory equipments, their basic functions and handling.	Report Writing	
3	Microscope and microscopy: Bright field, dark field, phases contrast, fluorescent, etc.	Report Writing	
4	Sterilization and disinfection	Report Writing	
5	Bacteriological media: Preparation and demonstration of various culture media: (basic, enriched, selective, differential, Enrichment, transport and storage media).	Report Writing	
6	Methods of bacterial cultivation and growth. Bacterial colonies: Types and Characteristics.	Report Writing	

7	Bacterial Identification and Antimicrobial susceptibility Tes	Report Writing	
	Common instruments used in virology Laboratory	Report Writing	
8	Safety precautions in virology laboratory	Report Writing	9
9	Cultivation and assay of viruses 3.1. egg inoculation 3.2. cell culture 3.3. laboratory animal inoculation	Report Writing	10
10	Haemagglutination inhibition test	Report Writing	11
11	Virus neutralization test	Report Writing	12
12	Enzyme linked immunosorbant assay	Report Writing	13
13	A study tour to Diagnostic/Research laboratories for practical demonstration of cell culture		14

6. Approval section

	Name	Signature
Chair holder		
Department head		

Veterinary Immunology



Bahir Dar University

College of Agriculture and Environmental Science

School of Animal Science and Veterinary Medicine

1. Course Information

Module Name	Animal Disease Agents and Immunity				
Module No.	03				
Course Title	Veterinary Immunology				
Course code	VtSc2033				
Credit Hrs/ECTS	Cr Hrs=2	Lecture Hrs=1	Laboratory=1	Home study=4	Cp/ECTS=3
Semester	II				
Year	II				
Pre-requisites	No				
Target group	Bachelor of Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

The course “Veterinary Immunology” is mainly concerned about body defenses of an animal against infectious agents and foreign substances.

Lectures: Veterinary Immunology deals with the History of Immunology; Cells, tissues and organs of the immune system, Innate Immunity and Adaptive Immunity; Major Histocompatibility Complex; Immunological Methods, Vaccination; Immune dysfunctions and their consequences.

Practical: Laboratory safety, Demonstration of various instruments; Reagent preparation, Immunological methods: Enzyme Immunoassay (EIA), Agglutination tests, Immuno-diffusion tests, Complement Fixation Test.

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3.Objectives of the Course

At the end of this course, the student should be able to:

- ✓ Describe the immune cells and tissues of the body
- ✓ Understand innate and adaptive immunity
- ✓ Understand immune responses and their mechanisms
- ✓ Differentiate the structural and functional aspects of antigens and antibodies
- ✓ Describe immune dysfunctions and their consequences

4.Syllabus

4.1.Course Contents, Methods, Strategies, and Learning Objectives

Weeks	Content and Sub-contents	Methods and Strategies	Student tasks	Learning objectives
1	Chapter 1:History of Immunology	✓ Lecturing on the history of immunology with pictorial demonstrations and videos	✓ Listen to the lecture and taking notes ✓ Paying attention to pictorial demonstrations and Videos	✓ Understand historical developments of immunity

2, 3	Chapter 2: Cells, tissues and organs of the immune system 2.5. White blood cells 2.6. Primary lymphoid organs 2.7. Secondary lymphoid organs	✓ Lecture on immune cells, and lymphoid tissues. ✓ Slide shows of immune cells and lymphoid tissues	✓ Listen to the lecture and taking notes ✓ Paying attention to slide demonstrations.	✓ Identify the different types of white blood cells ✓ Understand and differentiate between lymphoid tissues and lymphoid organs
4, 5, 6, 7	Chapter 3: Immunity 3.1. Innate Immunity 3.1.1. Anatomic barriers 3.1.2. Physiologic barriers 3.1.3. Phagocytic barriers 3,1,4. Inflammatory barriers 3.2. Adaptive Immunity 3.2.1. Humoral Immunity 3.2.2. Cell Mediated Immunity	✓ Lecture on Innate and Adaptive Immunity	✓ Listening to lecture and the taking notes	✓ Understand innate and adaptive immune mechanisms
8, 9	Chapter 4: Major Histocompatibility Complex (MHC) 4.1. Antigen presenting cells 4.2. MHC I 4.3. MHC II	✓ Lecturing on Major histocompatibility complex I and II	✓ Listening to the lecture and taking notes	✓ Understand the structure and function of MHC I and II
10, 11	Chapter 5: Immunological methods 5.1. Production of monoclonal antibodies	✓ Lecturing and pictorial demonstrations	✓ Listening to the lecture and paying attention to	✓ Understand monoclonal antibody production

	5.2. Immunoassays		pictorial demonstrations	✓ Knowing the different immuoassays
12, 13	Chapter 6: Vaccination/Immunization 6.1. Active and passive immunization 6.2. Types of Vaccines 6.3. Methods of Vaccine production 6.4. Modern approaches of Vaccine development	✓ Lecturing on vaccine types, methods of production and recent vaccine developments	✓ Listening to the lecture	✓ Describe vaccines and vaccination methods ✓ Understand recent development in vaccine production
14, 15	Chapter 7: Immune dysfunctions 7.1. Hypersensitivity reactions 7.2. Immuno-deficiencies 7.3. Autoimmune diseases	✓ Lecturing on immune dysfunctions	✓ Listening to the lecture	✓ Identify the different hypersensitivity reactions, immune-deficiencies and autoimmune diseases
16	Final Exam			
4.2. Assessment strategies, techniques and course policy				

Assessment	
➤ Quiz	7%
➤ Test.....	8%
➤ Assignment.....	10%
➤ Mid exam.....	25%
➤ Final exam.....	50%
➤ Total	100%

Course policies	
Student has to	
✓	Attend 85% of the class
✓	Take all continuous assessments and mid examination
✓	Take final examination
✓	Respect all rules and regulation of the University

References	
1. Abul K. Abbas; Andrew H. Lichtman; and Shiv Pillai: Cellular and Molecular Immunology. 7 th Edition	
2. Ian R. Tizard Veterinary Immunology: An introduction, 7 th Edition	

5. Practical/ Laboratory Section			
Week	Practical work	Tasks	Report submission date
1	Safety in Molecular laboratory	Report Writing	
2	Demonstration of laboratory equipment	Report Writing	
3	Sterilization and disinfection.	Report Writing	
4-16	Immunological methods	Report Writing	

6. Approval section		
	Name	Signature
Chair Holder		
Department Head		

Veterinary Pathology



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary Pathology				
Module No.	04				
Course Title	Veterinary Pathology				
Course code	Vtsc-2041				
Credit Hrs/ECTS	Cr Hrs=4	Lecture Hrs=3	Laboratory=2	Home study=9	Cp/ECTS=7
Semester	II				
Year	II				
Pre-requisites	No				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course description

Lecture: Introduction to veterinary pathology, definitions, terminologies, scope of pathology and causes of diseases. Disturbances of cell metabolism: degenerations, pathological calcification, disturbance of pigment metabolism. Necrosis, apoptosis, gangrene and postmortem changes. Hemodynamic disturbance: hyperemia/congestion, thrombo-emboli, infarction, hemorrhage, edema and shock. Inflammation and tissue repair, disturbances in cellular growth and differentiation, neoplasia. Immunopathology: hypersensitivity and autoimmune reactions. Response of the body to infection (host-pathogen interaction).

Practical: Demonstration of basic tissue alterations and autolytic changes on tissues or organs collected from postmortem and slaughter houses. Demonstration of post-mortem examination procedure, legal implication of post-mortem examination and report writing. Sample collection, preservation, labeling and dispatching. Demonstration of the paraffin technique in the preparation of histopathological sections. Examination of stained tissue sections or slides for the presence of microscopic pathological changes. Correlation of these findings with the gross findings and with theoretical knowledge.

3. Objectives of the Courses

At the end of the course student should able to:

- ✓ Have basic understanding on the pathogenesis of animal diseases
- ✓ Be familiar with the basic tissue alterations caused by different etiological agents
- ✓ Be able to identify, describe and interpret the macroscopic and microscopic changes resulted from disease condition
- ✓ Be able to conduct post-mortem procedures
- ✓ Use pathological findings for disease diagnosis and prognosis

4.Syllabous Components				
4.1.Course Contents, Methods, Strategies, and Learning Outcome				
Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	Chapter 1:General Introduction 1.1. Generalities 1.2. Classification 1.3. Pathological terminologies 1.4. Types of pathology 1.4. Scope and uses of pathology	<ul style="list-style-type: none"> ✓ Introduce Vet. Pathology ✓ Providing short note ✓ Brainstorming 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Develops positive attitude towards veterinary pathology ✓ Describe scopes, uses, types of pathology
2	Chapter 2: Cell pathology 2.1. Degeneration 2.2. Necrosis 2.3. Disturbances of cell Metabolism 2.3.1Pigmentation 2.3.2 Calcification	<ul style="list-style-type: none"> ✓ Introduce cell pathology ✓ Brainstorming ✓ Lecture on types ande mechanism cell injury, necrosis ✓ Providing short note on cell pathology 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand different ways of cell injury and necrosis ✓ Describe Disturbances of cell Metabolism

<p>3</p>	<p>Chapter 3: Growth Disturbances and Neoplasia</p> <p>4.1. Atrophy</p> <p>4.2. Hypertrophy</p> <p>4.3. Hypoplasia</p> <p>4.4. Hyperplasia</p> <p>4.5. Neoplasia</p>	<p>✓ Introduce Growth Disturbances and Neoplasia</p> <p>✓ Brainstorming</p> <p>✓ Lecture on Growth Disturbances and Neoplasia processes</p> <p>✓ Providing short note on growth disturbance and neoplasia</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion</p>	<p>✓ Understand growth disturbances</p> <p>✓ Describe natures and diagnosis of neoplasm</p>
<p>4</p>	<p>Chapter 4: Inflammation and Tissue repair</p> <p>8.1. Introduction</p> <p>8.2. Types of inflammation</p> <p>8.3. Types of Tissue repair mechanisms</p>	<p>✓ Lecture on nature of Inflammation and Tissue repair</p> <p>✓ Brainstorming</p> <p>✓ Providing short note On Inflammation and Tissue repair</p> <p>✓ Discussion</p> <p>✓ Class work</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion</p> <p>✓ Take reading assignment</p> <p>✓ Pear idea sharing</p>	<p>✓ Understand the concepts Inflammation and Tissue repair mechanisms</p>

5	Chapter5: Circulatory Disturbances 5.1. Edema 5.2. Congestion 5.3. Thrombosis and Embolism 5.4. Infarction 5.5. Shock 5.6. Derangements of Fluid and electrolyte balance	<ul style="list-style-type: none"> ✓ Introduce different Circulatory Disturbances ✓ Brainstorming ✓ Provide short note ✓ Discussion ✓ Class work 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Able to understand different forms of Circulatory Disturbances
6	Chapter 6: Immunopathology and Hypersensitivity 6.1.Generality of immune 6.2.Classification	<ul style="list-style-type: none"> ✓ Lecture on types of immune induced diseases and hypersensitivity ✓ Brainstorming ✓ Provide short notes on Immunopathology and Hypersensitivity ✓ Discussion 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Identify types of Immune induced diseases and Hypersensitivity
7	Chapter 7: Post Mortem Examination Techniques, Post Mortem Report Writing and Histopathological Techniques	<ul style="list-style-type: none"> ✓ Introduce Post Mortem Examination Techniques and Histopathological procedures ✓ Lecture on Post Mortem Examination Techniques, Post Mortem Report Writing and Histopathological Techniques 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment ✓ Peer idea sharing 	<ul style="list-style-type: none"> ✓ Understand Post Mortem Examination Techniques, Post Mortem Report Writing and Histopathological Techniques

8	Chapter 8: Pathology of Digestive System	<ul style="list-style-type: none"> ✓ Introduce Pathology of Digestive System ✓ Lecture on types of sampling ✓ Provide short note ✓ Class discussion 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Describe different diseases of Digestive System
9	Chapter 9. Pathology of Respiratory System Chapter 10. Pathology of Nervous System	<ul style="list-style-type: none"> ✓ Introduce diseases of Respiratory System and Nervous System ✓ Brainstorming ✓ Lecture on different types of tests 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork 	<ul style="list-style-type: none"> ✓ Describe the diseases of Respiratory System and Nervous System
10	Chapter 11: Pathology of Integumentary System	<ul style="list-style-type: none"> ✓ Lecture on disorder Integumentary System ✓ Class discussion ✓ Brainstorming 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork 	<ul style="list-style-type: none"> ✓ Describe disorder Integumentary System

11	Chapter 12. Pathology of Urogenital System	<ul style="list-style-type: none"> ✓ Lecture on different diseases Urogenital System ✓ Class discussion ✓ Brainstorming 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork 	<ul style="list-style-type: none"> ✓ Describe diseases Urogenital System
12	Chapter 13. Pathology of Musculoskeletal System	<ul style="list-style-type: none"> ✓ Lecture on Musculoskeletal disorder ✓ Class discussion ✓ Brainstorming ✓ Provide short note on components of risk analysis 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork 	<ul style="list-style-type: none"> ✓ Understand the concepts of Musculoskeletal disorder
13	Chapter 14. Pathology of Cardiovascular System	<ul style="list-style-type: none"> ✓ Introduce different Cardiovascular diseases ✓ Brainstorming ✓ Provide short note ✓ Discussion ✓ Class 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Able to understand different Cardiovascular diseases

		work		
14	Chapter 15. Pathology of Haemopoitic and Immune system	<ul style="list-style-type: none"> ✓ Introduce different disorder of Haemopoitic and Immune system Brainstorming ✓ Provide short note ✓ Discussion ✓ Class work 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Able to understand different disorder of Haemopoitic and Immune system
15	Chapter 16. Pathology of Endocrine system, Eyes and Ear	<ul style="list-style-type: none"> ✓ Introduce different diseases of Endocrine system, Eyes and Ear ✓ Brainstorming ✓ Provide short note ✓ Discussion ✓ Class work 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Able to understand diseases of Endocrine system, Eyes and Ear
16	Final exam			
4.2.assessment strategies and techniques and courses policy				

Assessment	
• Quiz	7%
• Test.....	8%
• Assignment.....	10%
• Mid exam.....	25%
• Final exam.....	50%
• Total	100%

Courses policy
Student has to

Attend 85% of the class
take all continuous assessment and mid exam
Take final exam
Respect all rules and regulation of the university

1. References

1. Thomas Carlyle Jones,(1997). Veterinary Pathology
2. David O. Slauson, Barry J. Cooper (2001). Mechanisms of Disease: A Textbook of Comparative General pathology.
3. Ramzi S. Cotran(2000). Robbins Pathologic Basis of Disease
Thomson (2000). Thomson’s Special Veterinary Pathology

S/No	Practical work	Tasks	Due date for submission of report
1	Demonstration of basic tissue alterations and autolytic changes on tissues or organs collected from postmortem and slaughter houses	Report Writing	3
2	Demonstration of post-mortem examination procedure, legal implication of post-mortem examination and report writing	Report Writing	4
3	Necrosis, apoptosis, gangrene and postmortem changes. Hemodynamic disturbance: hyperemia/congestion, thrombo-emboli, infarction, hemorrhage, edema and shock	Report Writing	5
4	Inflammation and tissue repair, disturbances in cellular growth and differentiation, neoplasia	Report Writing	6

Approval section		
	Name	Signature
Chair holder		
Department head		

Veterinary Clinical Pathology



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary Pathology				
Module No.	04				
Course Title	Veterinary Clinical Pathology				
Course code	Vtsc-4042				
Credits hour (Cr hr) ECTS	Cr Hrs=3	Lecture Hrs=2	Laboratory=1	Home study=7	Cp/ECTS=5
Semester	I				
Year	IV				
Target group	Bachelor Veterinary Science				
Pre-requisites	Veterinary Pathology				
Status of the course	Compulsory				
Instructor name and address					

2. Course description

The courses of veterinary Clinical Pathology deals with specimen collection, processing and packaging modalities; Hematology and Hematological Disorders; Diagnostic Cytology and Serum Biochemistry.

Lecture: The course deals with the fundamental principles and mechanisms associated with the rise, development and termination of disease processes. It emphasizes on the physiologic changes and responses that produce signs and symptoms. The application of laboratory procedures and interpretation of test results is the basis for the course of clinical pathology.

Practical: Particular emphasis is given to clinical laboratory setups, preparation and shipment of laboratory specimens, hematology, plasma biochemistry, enzymology and clinical immunology. Important species differences are described.

3. Course objectives

At the end of the course students should:

- ✚ Be familiar with different laboratory diagnostic tools and procedures,
- ✚ Understand pathophysiological changes underlying various disease conditions and their implications on the wellbeing of the animal,
- ✚ perform various laboratory tests, interpret test results and correlate with history and clinical signs,
- ✚ Be familiar with different laboratory reagents, equipments and materials.

4. Syllabus Components

4.1. Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	<p>Chapter 1: Introduction to veterinary clinical pathology</p> <p>1.1. The basic clinical pathology laboratory</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Pathology ✓ Lecture on clinical pathology ✓ Providing short note on introduction to clinical pathology 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand the Purpose of using laboratory procedures ✓ Describe scopes and components Clinical Pathology

<p>2</p>	<p>1.2. Preparation and shipment of laboratory specimens</p> <p>1.2. Sample collection and its precautions</p> <p>1.3. Records</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Specimen collection ✓ Lecture on Preparation and shipment of laboratory specimens ✓ Providing short note on Preparation and shipment of laboratory specimens 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Describe different types of Sample ✓ Demonstrate specimen preparation and shipment for laboratory analysis ✓ Formulate Record keeping formats for different samples
<p>3</p>	<p>2. Hematology</p> <p>2.1. Basic principles of hematology</p> <p>2.1.1. Blood coagulation and hemostasis</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Blood composition ✓ Lecture on Basic principles of hematology, Blood coagulation and hemostasis ✓ Providing short note on Blood Sample collection, Blood coagulation and hemostasis 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Internalize the Basic principles of hematology

4	2.1.3. Anticoagulants 2.1.4. Factors affecting hematological works 2.1.5. The blood film	<ul style="list-style-type: none"> ✓ Brainstorming about Anticoagulants and their effect ✓ Lecture on Anticoagulants, Factors affecting hematological works and blood film preparation ✓ Providing short note on Anticoagulants, Factors affecting hematological works and blood film preparation. 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Describe Anticoagulants and Factors affecting hematological works ✓ Demonstrate Blood film preparation ✓ Compare the different types of blood film preparation
5	2.2. Erythrocyte examinations 2.2.1. Erythrocyte production, breakdown and control of erythropoiesis 2.2.2. Number and morphology of erythrocytes.	<ul style="list-style-type: none"> ✓ Brainstorming about Erythrocyte production, breakdown and control of erythropoiesis ✓ Lecture on Erythrocyte production, Morphology, breakdown and control of erythropoiesis ✓ Providing short note on Erythrocyte production, Morphology, breakdown and control of erythropoiesis 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Internalize Erythrocyte production, Morphology, breakdown and control of erythropoiesis
6	2.2.3. PCV, Hemoglobin determination 2.2.4. Erythrocyte fragility Test 2.2.5. Sedimentation rate	<ul style="list-style-type: none"> ✓ Brainstorming about PCV, Hemoglobin determination ✓ Lecture on PCV, Hemoglobin determination, Erythrocyte fragility Test and 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the 	<ul style="list-style-type: none"> ✓ Understand PCV, Hemoglobin determination, ✓ Demonstrate Erythrocyte fragility Test and Sedimentation rate

		<ul style="list-style-type: none"> ✓ Sedimentation rate ✓ Providing short note on PCV, Hemoglobin determination, Erythrocyte fragility Test and Sedimentation rate 	<ul style="list-style-type: none"> lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	
7	<p>2.2.6. Erythrocyte abnormalities</p> <p>2.2.6.1. Anemia and its classifications</p> <p>2.2.6.2. Polycythemia</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Erythrocyte disorders ✓ Lecture on Erythrocyte disorders, Anemia and its classifications, Polycythemia ✓ Providing short note on Erythrocyte disorders, Anemia and its classifications, Polycythemia. 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand and explain about Erythrocyte disorders, Anemia and its classifications, Polycythemia
8	<p>2.3. Leukocytes examination</p> <p>2.4. Indications for leukocyte examination</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Leukocytes ✓ Lecture on Leukocytes and Indications for leukocyte ✓ Providing short note on Leukocytes Examination and Indications for leukocyte examination 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand and explain about Leukocytes examination and Indications for leukocyte examination

9	2.5. Leukocyte count and morphology 2.6. Interpretation of leukocyte count	<ul style="list-style-type: none"> ✓ Brainstorming about Leukocyte count and morphology ✓ Lecture on Leukocyte count, morphology and Interpretation of leukocyte count ✓ Providing short note on Leukocyte count, morphology and Interpretation of leukocyte count 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand and explain about Leukocyte morphology ✓ Demonstrate Leukocyte count
10	2.7. Leukocyte abnormalities	<ul style="list-style-type: none"> ✓ Brainstorming about Leukocyte abnormalities ✓ Lecture on Leukocyte abnormalities ✓ Providing short note on Leukocyte abnormalities 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand and Describe the different types of Leukocyte abnormalities
11	3. General hematological disorders 3.1. Thrombocytes 3.2. Coagulation defects 3.3. Hemorrhagic disorders	<ul style="list-style-type: none"> ✓ Brainstorming about Thrombocytes and the cascade of coagulation ✓ Lecture on Thrombocytes, Coagulation defects and Hemorrhagic disorder ✓ Providing short note on 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the 	<ul style="list-style-type: none"> ✓ Understand and Describe Thrombocytes, Coagulation defects and Hemorrhagic disorder

		Thrombocytes, Coagulation defects and Hemorrhagic disorder	lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	
12	4. Diagnostic cytology 4.1. Introduction to Diagnostic cytology 4.2. Techniques in diagnostic cytology 4.3. Cytology for the diagnosis of neoplastic and non- neoplastic masses	✓ Brainstorming about Diagnostic cytology ✓ Lecture on Diagnostic cytology, Techniques in diagnostic cytology and Cytology for the diagnosis of neoplastic and non-neoplastic masses ✓ Providing short note on Diagnostic cytology, Techniques in diagnostic cytology and Cytology for the diagnosis of neoplastic and non-neoplastic masses	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Understand and Describe Diagnostic cytology ✓ Demonstrate the different Techniques in diagnostic cytology ✓ Operate neoplastic and non- neoplastic masses for cytological diagnosis
13	4.3. Synovial and body cavity fluids 4.4. Genital fluids 4.5 Application of cytology in different disease conditions	✓ Brainstorming about Synovial, body cavity fluids and Genital fluids ✓ Lecture on Synovial, body cavity fluids and Genital fluids; and Application of cytology in different disease conditions ✓ Providing short note on Synovial, body cavity fluids and	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Understand and Describe Synovial, body cavity fluids and Genital fluids ✓ Operate cytology in different disease diagnosis

			Genital fluids; and Application of cytology in different disease conditions		
14	5. Clinical biochemistry of serum 5.1. Introduction to serum Biochemistry 5.2. Major components of serum	<ul style="list-style-type: none"> ✓ Brainstorming about Serum and its biochemistry ✓ Lecture on serum Biochemistry, components of serum, ✓ Providing short note on serum Biochemistry, and components of serum. 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand and describe serum Biochemistry, and components of serum 	
15	5.3. Types of Serum Biochemistry Tests 5.4. Serum for the diagnosis of disease	<ul style="list-style-type: none"> ✓ Brainstorming about Serum Biochemistry Tests ✓ Lecture on Serum Biochemistry Tests and its application. ✓ Providing short notes on Serum Biochemistry Tests and its application. 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading 	<ul style="list-style-type: none"> ✓ Understand and describe Types of Serum Biochemistry Tests ✓ Operate serum biochemistry test in different disease conditions. 	

			assignment	
16	6. Examination of bone marrow 6.1. Interpretation of bone marrow examination 6.2. Indications of bone marrow examination 6.3. Collection of bone marrow specimen	<ul style="list-style-type: none"> ✓ Brainstorming about Examination of bone marrow ✓ Lecture on Interpretation of bone marrow examination; Indications of bone marrow examination and Collection of bone marrow specimen ✓ Providing short note on Interpretation of bone marrow examination; Indications of bone marrow examination and Collection of bone marrow specimen 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand and Describe Interpretation of bone marrow examination; Indications of bone marrow examination ✓ Operate bone marrow specimen collection.

4.2.assessment strategies and techniques and courses policy

Assessment	
✓ Quiz	7%
✓ Test.....	8%
✓ Assignment.....	10%
✓ Mid exam.....	25%
✓ Final exam.....	50%
✓ Total	100%

Courses policy	
Student has to	
✓ Attend 85% of the class	
✓ take all continuous assessment and mid exam	
✓ Take final exam	

✓ Respect all rules and regulation of the university

References

1. Radostits, O.M. D.C. Blood, & C.C. Gay, 1994, Veterinary Medicine, 8th Ed., Bailliere Tindall, London.
2. Kelly, W.R. 1975. Veterinary Clinical diagnosis, 2nd Ed., Bailliere Tindal & Casell,
3. Andrews, A.H. 1990. Outline of Clinical Diagnosis in Cattle, Butterworths and Company London.
4. Pinsent, P.J.N. & C.J. Fuller 1997. Outline of Clinical Diagnosis in Horse. Blackwell Science, Oxford U, London.

Proposed practical activity for Veterinary Clinical Pathology;

- ✓ Clinical laboratory setup
- ✓ Determination of PCV, Hb concentration and other erythrocyte parameters
- ✓ Blood smear preparation and examination
- ✓ Eosinophil count/differential leukocyte count
- ✓ Buffy coat examination
- ✓ Erythrocyte fragility test and erythrocyte sedimentation rate
- ✓ Serum biochemical analysis and pepsinogen concentration
- ✓ Platelets count and coagulation test
- ✓ Determination of bleeding and coagulation time
- ✓ Evaluation of bone marrow parameters
- ✓ Spectrophotometry

Approval section

	Name	Signature
Chair holder		
Department head		

Veterinary pharmacology and toxicology



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

Course Information

Module Name	Veterinary pharmacology and toxicology				
Module No.	05				
Course Title	Veterinary Pharmacology and therapeutics				
Course code	Vtsc3051				
Credits hour (Cr hr) ECTS	Cr Hrs=3	Lecture Hrs=2	Laboratory=1	Home study=7	Cp/ECTS=5
Semester	I				
Year	III				
Target group	Bachelor Veterinary Science				
Pre-requisites	None				
Status of the course	Compulsory				
Instructor name and address					

2. Course description

Lecture: General principles of drug action, drug dose response, mechanism of drug actions, Pharmacokinetics and Pharmacodynamics, drug interactions, agonists and antagonists, major adverse effects, and management of adverse reactions are studied. Emphasis is given to drugs that alter tissues and system functions including autonomic nervous system, cardiovascular, digestive, respiratory and urinary systems. General and local anesthesia, sedatives, tranquilizer analgesics, anti-inflammatory agents and fluid therapy. Deals also with drugs acting on bacteria, virus, fungus and parasites

Practical: Pharmacy: fittings and apparatus, labeling, custody of poisons, weighing of drugs, compounding of preparation; pharmacy calculations, dispensing. Demonstrations: effect of CNS depressants, analgesics, CNS stimulants, muscle relaxants and local anesthetics in laboratory animals, demonstration of the action of

adrenergic and cholinergic agonists and blockers on isolated and intact preparations of animals; action of sympathomimetic drugs, parasympathomimetics, sympathetic and parasympathetic blockers, ganglionic-stimulants and blockers.

3. Course objectives

At the end of the course students should:

- Understand basic concepts and principles of pharmacology and therapeutics.
- Correlate the biological effects of drugs to the pathophysiology of diseases.
- Able to apply the general and specific principles of pharmacology for clinical practice of veterinary medicine.
- Handle and rationally prescribe veterinary pharmaceuticals and biologicals.
- Be able to correlate the knowledge of pharmacology with allied biological and biomedical sciences.

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Wee ks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	1. General Pharmacology 1.1 Introduction 1.2 Pharmacokinetics 1.2.1 Absorption, route of administration 1.2.2 Bioavailability 1.2.3 Distribution 1.2.4 Biotransformation 1.2.5 Excretion	✓ Brainstorming about Pharmacokinetic ✓ Lecture on Pharmacokinetic ✓ Providing short note on Pharmacokinetic	✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Understand basic concepts & principles of pharmacology and therapeutics. ✓ Understand about Pharmacokinetic
2	1.3. Pharmacodynamics 1.3.1 Mechanism of drug actions, 1.3.2 receptors and theories of occupation,	✓ Brainstorming about Pharmacodynamics	✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in	✓ Understand basic concepts & principles of Pharmacodynamics
3	1.4. Adverse drug reactions (ADR) Causes and management, Evaluation and safety	✓ Brainstorming about Adverse drug reactions & its management ✓ Lecture on Adverse drug reactions & its management	✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing	✓ Understand the adverse drug reactions & its management

		<ul style="list-style-type: none"> ✓ Providing short note on Adverse drug reactions & its management 	<ul style="list-style-type: none"> ✓ Ask & answer question ✓ Take part on reading assignment 	
4	1.5. Drug Interactions Types of drug interactions, Pharmaceutical, Pharmacokinetics, Pharmacodynamics	<ul style="list-style-type: none"> ✓ Brainstorming about Drug Interactions ✓ Lecture on Drug Interactions ✓ Providing short note on Drug Interactions 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand about Drug Interactions
5	2.Special Pharmacology 2.1 Neuropharmacology 2.1.1 Drugs acting on autonomic and somatic nervous system 2.1.2 Drugs acting on Central nervous system 2.1.3 Local Anesthetics (techniques and types)	<ul style="list-style-type: none"> ✓ Brainstorming about Neuropharmacology ✓ Lecture on Neuropharmacology ✓ Providing short note on neuropharmacology 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand Neuropharmacology ✓ Apply drugs on the nervous system
6	2.2. Cardiovascular pharmacology 8.2.1 Cardiac glycosides 2.2.2 Vasodilators 2.2.3 Antiarrhythmic drugs 2.2.4. Hematinic drugs 2.2.5. Hemostatic and anticoagulants	<ul style="list-style-type: none"> ✓ Brainstorming about Cardiovascular pharmacology ✓ Lecture on Cardiovascular pharmacology ✓ Providing short 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing 	<ul style="list-style-type: none"> ✓ Understand Cardiovascular pharmacology ✓ Apply drugs on the Cardiovascular system

		note on Cardiovascular pharmacology	<ul style="list-style-type: none"> ✓ Ask & answer question ✓ Take part on reading assignment 	
7	2.3 The urinary system pharmacology (diuretics, antidiuretics, urine acidifiers and alkalinizers, fluid therapy)	<ul style="list-style-type: none"> ✓ Brainstorming about Drugs acting on urinary system Lecture on Drugs acting on urinary system ✓ Providing short note on Drugs acting on urinary system 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand urinary system pharmacology ✓ Apply drugs acting on the urinary system
8	2.5. Drugs affecting GIT functions 2.5.1. Emetics & antiemetics 2.5.2. Anti-ulcer drugs 2.5.3. GI protectants and absorbents 2.5.4. Laxatives and cathartics 2.5.5. Treatment of bloat	<ul style="list-style-type: none"> ✓ Brainstorming about drugs affecting GIT functions ✓ Lecture on drugs affecting GIT functions ✓ Providing short note on drugs affecting GIT functions 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand drugs affecting GIT functions ✓ Apply drugs acting drugs affecting GIT functions
9	2. 4. Endocrine Pharmacology 2.4.1. Reproductive hormones 2.4.2. Other endocrine hormones	<ul style="list-style-type: none"> ✓ Brainstorming about endocrine pharmacology ✓ Lecture on endocrine pharmacology ✓ Providing short note on endocrine 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing 	<ul style="list-style-type: none"> ✓ Understand about endocrine pharmacology ✓ Apply endocrine hormone

		pharmacology	<ul style="list-style-type: none"> ✓ Ask & answer question ✓ Take part on reading assignment 	
10	3. Chemotherapy of bacterial Diseases 3.1 General principle of antibacterial therapy 3.2 Antiseptics and disinfectants 3.3 Sulphonamide 3.4 Penicillins, Cephalosporin and other beta-lactams 3.5 Tetracycline 3.6 Aminoglycosides Macrolides, 3.7 Chloramphenicol and Fluoroquinolones. 3.8 Miscellaneous Antibacterial agents (Polymyxins, Bacitracins, vancomycin, Novobiocin, Nitrofurans, Nitroimidazoles)	<ul style="list-style-type: none"> ✓ Brainstorming about chemotherapy of bacterial diseases ✓ Lecture on chemotherapy of bacterial diseases ✓ Providing short note on chemotherapy of bacterial diseases 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand about chemotherapy of bacterial diseases ✓ Apply drugs acting on bacterial diseases
11	4. Antifungal Drugs 4.1 General principles of Antifungal therapy 4.2 Classification of Antifungal agents 4.3 Topical and systemic antifungal agents (Azole groups, Amphotericin B, Flucytocine, Griseofulvin and Nystatin)	<ul style="list-style-type: none"> ✓ Brainstorming about Antifungal drugs ✓ Lecture on Antifungal drugs ✓ Providing short note on Antifungal drugs 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing 	<ul style="list-style-type: none"> ✓ Understand about Antifungal drugs ✓ Apply drugs acting on fungus

			<ul style="list-style-type: none"> ✓ Ask & answer question ✓ Take part on reading assignment 	
12	5. Anti-Viral Drugs 5.1 General principles of anti-viral therapy 5.2 Specific anti-viral Drugs: Acyclovir, cidofovir, Lamivudine, Ganciclovir, Idoxuridine, Rimantadine, Vidarabine, Immunoglobulin, Interferons, and others	<ul style="list-style-type: none"> ✓ Brainstorming about Anti-Viral Drugs ✓ Lecture on Anti-Viral Drugs ✓ Providing short note on Anti-Viral Drugs 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand about Anti-Viral Drugs ✓ Apply antiviral drugs
13	6. Antiparasitic Drugs 6.1 General principles of antiparasitic therapy 6.2 Antiprotozoal agents 6.3 Antinematodal drugs 6.4 Antitrematodal drugs 6.5 Anticestodal drugs 6.6 Insecticides	<ul style="list-style-type: none"> ✓ Brainstorming about Antiparasitic drugs ✓ Lecture on Antiparasitic drugs ✓ Providing short note on Antiparasitic drugs 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand about antiparasitic drugs ✓ Apply antiparasitic drugs
14	3. Chemotherapy of Neoplastic Diseases 7.1 General principles of Cancer therapy 7.2 Common drugs	<ul style="list-style-type: none"> ✓ Brainstorming about neoplastic drugs ✓ Lecture on neoplastic drugs ✓ Providing short note on neoplastic drugs 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading 	<ul style="list-style-type: none"> ✓ Understand about neoplastic drugs ✓ Apply neoplastic drugs

			assignment	
15	8. Anti-inflammatory drugs and their mediators	<ul style="list-style-type: none"> ✓ Brainstorming about Anti-inflammatory drugs ✓ Lecture on Anti-inflammatory drugs ✓ Providing short note on Anti-inflammatory drugs 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand about Anti-inflammatory drugs ✓ Apply Anti-inflammatory drugs
16	Final exam			

4.2.assessment strategies and techniques and courses policy

Assessment

• Quiz	7%
• Test.....	8%
• Assignment.....	10%
• Mid exam.....	25%
• Final exam.....	50%
• Total	100%

Courses policy

Student has to

- Attend 85% of the class
- Take all continuous assessment and mid exam
- Take final exam
- Respect all rules and regulation of the university

References

4. Kourounakis and Kerra (2005). Advanced Drug Design and Development
5. Amanda Rock, (2007). Veterinary Pharmacology 1st Edition, Elsevier
6. Jim E. Riviere, Mark G. Papich, (2009). Veterinary Pharmacology and Therapeutics, John Wiley & Sons.
7. Adams HR (Ed.) (2001). Veterinary Pharmacology and Therapeutics, 8th Edition. Blackwell Publishing, Ames, IA.

8. Jim E. Riviere, Mark G. Papich (2017) Veterinary Pharmacology and Therapeutics, 10th Edition, Wiley Black well		
2. Propose practical activity for veterinary epidemiology and preventive medicine		
✓ Pharmacy: fittings & apparatus, labelling, custody of poisons, weighing of drug		
✓ Compounding of preparation; pharmacy calculations, dispensing		
✓ Demonstrations: effect of CNS depressants, analgesics, CNS stimulants, muscle relaxants & local anesthetics in laboratory animals,		
✓ Demonstration of the action of adrenergic and cholinergic agonists and blockers on isolated and intact preparations of animals		
✓ Action of sympathomimetic drugs, Parasympathomimetics		
✓ Sympathetic and parasympathetic blockers		
✓ Ganglionics-stimulants & blockers.		
✓ Demonstration of drugs used for bacterial Diseases		
✓ Demonstration of drugs used for fungal disease		
✓ Demonstration of drugs used for protozoal disease		
✓ Demonstration of drugs used for nematode trematode & cestode		
✓ Demonstration of acaricides & insecticide		
✓ Demonstration of anti-inflammatory drugs		
Approval section		
	Name	Signature
Chair holder		
Department head		

Veterinary Toxicology



Bahir Dar University

College of Agriculture and Environmental Science

School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary Pharmacology & Toxicology				
Module No.	08				
Course Title	Veterinary Toxicology				
Course code	Vtsc2062				
Credit Hrs/ECTS	Cr Hrs=2	Lecture Hrs=1	Laboratory=1	Home study=4	Cp/ECTS=3
Semester	II				
Year	III				
Pre-requisites	No				

Target group	Bachelor Veterinary Science			
Status	Compulsory			
Instructor name and address				
2.Course Description				
<p>Lecture: Studies concept of poisoning, mechanism of action of poisons, factors affecting the action of poisons, diagnosis and treatment of poisoning; chemical poisoning, plant poisoning, venomous bites and stings, environmental toxicosis, radiation hazards, toxicosis due to food additives and preservatives and commonly used drugs.</p> <p>Practical: Collection and demonstration of toxic plants; experimental detection of poisoning caused by different toxicants and their treatment; calculation of LD50 and ED50 and demonstration of drug toxicity</p>				
3.Objectives of the Courses				
At the end of the course student should able to:				
<ul style="list-style-type: none"> ✓ Know the concepts and principles of poisoning caused by various classes of toxicants ✓ Be able to identify the major toxic agents affecting livestock and other animals. ✓ Envisage mechanisms of diagnosis and treatment and control methods to ensure the safety of the animals and end-users. 				
4.Syllabus Components				
4.1.Course Contents, Methods, Strategies, and Learning Outcome				
Week	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1, 2	1. General Introduction 1.1 Introduction to veterinary toxicology 1.2 Concept of poisoning 1.3 Exposure	✓ Introduce vet. Toxicology ✓ Lecture poisoning ✓ Classification of poisons ✓ Lecture on different route of exposure	✓ Listen the lecture and take short notes ✓ Forward all the confusion/doubts in relation to the given lecture	✓ Develops positive attitude towards the courses ✓ Describe concept of poison and different route of exposure for poisons

3,4	3. Toxicodynamics and Toxicokinetics 3.1. Absorption, chemical transport and distribution 3.2. Biotransformation and elimination. 3.3. Mechanism of action of poisons 3.4. Factors affecting the action of poisons	✓ Brainstorming ✓ Introduce Toxicodynamics and Toxicokinetics ✓ Lecture poison absorption, chemical transport and distribution, biotransformation, mechanism of action and different factors affecting the action of poisons ✓ Providing short note	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Understand the concept of Toxicodynamics and Toxicokinetics ✓ Describe different factors affecting the action of poisons
5	3. Diagnosis and treatment of poisoning 3.1 Diagnosis of poisoning 3.2 Treatment of poisoning	✓ Revise previous lesson ✓ Brainstorming ✓ Lecture on different types of sample for diagnosis of poisoning ✓ Lecture on different types of diagnostic techniques for poisoning ✓ Provide lecture on different treatment option for poisoning ✓ Providing short note	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion	✓ Understand different diagnostic techniques of poisoning ✓ Identify general principles and options of treatment for poisoning

6	9. Acid and base poisoning 9.1. Acid and alkaline corrosives 9.2. Ammonium and urea poisoning	✓ Brainstorming ✓ Lecture acid and alkaline corrosive ✓ Lecture on ammonia and urea poisoning ✓ Clinical signs, diagnosis and treatment ✓ Providing short note ✓ Practical demonstration	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment ✓ Pear idea sharing	✓ Identify the clinical signs, diagnosis and treatment of acid and base poisoning
7,8,9,10,11,12,14	10. Classes of toxicants 5.1 Chemical toxicity 5.1.1 Inorganic 5.1.2 Organic 5.2 Phytotoxicity 5.2.1 Generalities 5.2.2 Cyanogenic plants, Nitrate/nitrite poisoning, oxalate poisoning 5.2.3 Plants causing photosensitivity 5.2.4 Plants Causing Thiamine Deficiency	✓ Brain storming ✓ Introduce classification of toxicants ✓ Providing lecture and short note on different chemical causing toxicity. ✓ Lecture on different types of plants that cause toxicity ✓ Clinical signs, diagnosis, treatment and prevention ✓ Practical demonstration of toxic chemicals and plants	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	✓ Understand classification of toxicants ✓ Able to identify source, clinical signs, diagnosis, treatment and prevention of poisoning chemicals and different toxic plants for animals.

	5.2.5 Teratogenic plants 5.2.6 Plant with other actions			
15	11. Mycotoxicosis	<ul style="list-style-type: none"> ✓ Brain storming on Mycotoxicosis ✓ Define Mycotoxicosis ✓ Lecture on common fungus producing toxin ✓ Clinical signs, diagnosis, treatment and prevention ✓ Providing short notes 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Identify fungus responsible for Mycotoxicosis ✓ Able to identify the source, clinical signs, diagnosis, prevention and treatment of Mycotoxicosis
16	12. Venomous bites and stings	<ul style="list-style-type: none"> ✓ Brain storming about venom ✓ Introduce venoms ✓ Lecture on snake, spider, scorpion, honeybee and other venoms ✓ Clinical signs, diagnosis, treatment and prevention ✓ Practical demonstration 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Identify different source of venom ✓ Able to identify the clinical signs, diagnosis, prevention and treatment of venom poisoning in animals
16	Final exam			
4.2.assessment strategies and techniques and courses policy				
Assessment				
✓ Quiz7%				

✓ Test.....	8%
✓ Assignment.....	10%
✓ Mid exam.....	25%
✓ Final exam.....	50%
✓ Total	100%

Courses policy

Student has to

- ✓ Attend 85% of the class
- ✓ take all continuous assessment and mid exam
- ✓ Take final exam
- ✓ Respect all rules and regulation of the university

References:


- ✓ Osweiler GD, Carson TL, Buck WB, Van Gelder GA. Clinical and diagnostic veterinary toxicology. Dubuque (Ia): Kendall/Hunt; 1985.
- ✓ Gary Osweiler (2001). Veterinary Toxicology
- ✓ Gupta, R.C. ed., 2012. *Veterinary toxicology: basic and clinical principles*. Academic press.
- ✓ Clarke, E.G.C. and Clarke, M.L., 1967. *Garner's Veterinary toxicology. Garner's Veterinary toxicology.*, (Edn 3).
- ✓ Lander, G.D., 1926. *Veterinary Toxicology. Veterinary Toxicology.*, (Edn 2).

0. Propose practical activity for veterinary toxicology includes:

Week	Practical Activities	Task
7, 8	Collection plants and demonstration of toxic	Demonstration and report writing
9,10	Experimental detection of poisoning caused by different toxicants and their treatment	Demonstration and report writing
11,1 2,13	Calculation of LD50 and ED50 and Demonstration of drug toxicity.	Demonstration and report writing

Approval section		
	Name	Signature
Chair holder		
Department head		

Veterinary General Medicine

 <p>Bahir Dar University College of Agriculture and Environmental Science School of animal science and veterinary medicine</p>					
1. Course Information					
Module Name	Animal disease and preventive medicine				
Module No.	06				
Course Title	Veterinary General Medicine				
Course code	Vtsc3061				
Credits hour (Cr hr) ECTS	Cr Hrs=3	Lecture Hrs=3	Laboratory=0	Home study=7	Cp/ECTS=5
Semester	I				
Year	III				

Target group	Bachelor Veterinary Science
Pre-requisites	Vet Parasitology, Vet Microbiology, veterinary pathology
Status of the course	Compulsory
Instructor name and address	

2. Course description

General systemic states: toxemia, septicemia, bacteremia, fever, hyperthermia, hypothermia, heat stroke, dehydration, electrolytes and acid-base imbalances, allergies. Diseases of alimentary system: stomatitis, pharyngitis, esophageal disorders, simple indigestion, ruminal acidosis and alkalosis, ruminal tympany, traumatic reticuloperitonitis/ pericarditis, impaction of abomasum, neonatal infections, enteritis, equine colic, gastritis and principle of GIT treatment. Hepatobiliary System: Hepatitis, jaundice and cholelithiasis. Cardiovascular system: arrhythmias, myocarditis, endocarditis, valvular heart disease, circulatory failure, thrombosis and embolism, congenital cardiac defects and shock, edema. Hematopoietic and hemolymphatic system: anemia, leukemia, leucopenia. Respiratory system: pneumonia, bronchitis and pleurisy. Diseases of the urinary, nervous and musculoskeletal systems.

3. Course objectives

At the end of the course students should:

- Familiar with the commonly used clinical instruments and drugs
- Equipped with methods of clinical examinations and diagnosis on sick animals;
- Able to recognize the syndromes common to all diseases affecting all body systems;
- Able to understand and appreciate the harmful microbial, genetic and environmental influences on animal health and production

4. Syllabus Components

4.1. Course Contents, Methods, Strategies, and Learning Outcome

Wee ks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	Chapter I General systemic states 1.1 Toxemia 1.2 Septicemia, Viremia, Localized infection and	<ul style="list-style-type: none"> ✓ Brainstorming about Toxemia, Septicemia, Viremia, Localized infection and pain ✓ Lecture on Toxemia, Septicemia, Viremia, 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture 	<ul style="list-style-type: none"> ✓ et familiarized with Toxemia, Septicemia, Viremia, Localized infection and pain

	pain	<p>Localized infection and pain</p> <ul style="list-style-type: none"> ✓ Providing short note on Toxemia, Septicemia, Viremia, Localized infection and pain 	<ul style="list-style-type: none"> ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	
2	<p>1.3Hyperthermia, Hypothermia, Fever</p> <p>1.4 Disturbance of fluid and electrolyte imbalance</p>	<p>Brainstorming about hyperthermia, Fever Hypothermia, Disturbance of fluid and electrolyte imbalance</p> <p>Lecture on hyperthermia, Fever Hypothermia, Disturbance of fluid and electrolyte imbalance</p> <p>Providing short note on hyperthermia, Fever Hypothermia, Disturbance of fluid and electrolyte imbalance</p>	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Pear idea sharing 	<ul style="list-style-type: none"> ✓ Get familiarized with Hyperthermia, Hypothermia, Fever, Disturbance of fluid and electrolyte imbalance
3	1.5 Allergy/Hypersensitivity	<ul style="list-style-type: none"> ✓ Brainstorming about Allergy/Hypersensitivity ✓ Lecture on Allergy/Hypersensitivity ✓ Providing short note on Allergy/Hypersensitivity 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand about Allergy/Hypersensitivity
4	<p>Chapter II: Diseases of the new born</p> <p>2.1 Neonatal infection</p> <p>2.2. Practical antimicrobial therapeutics Antimicrobial drugs</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Diseases of the new born Neonatal infection, Practical antimicrobial therapeutics Antimicrobial drugs ✓ Lecture on Diseases of the new born Neonatal infection, Practical antimicrobial therapeutics Antimicrobial drugs ✓ Providing short note on Diseases of the new born 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ understand Diseases of the new born Neonatal infection, ✓ able to apply antimicrobial therapeutics & drugs

		Neonatal infection, Practical antimicrobial therapeutics Antimicrobial drugs		
5	Chapter III Diseases of the alimentary tract 3.1 Stomatitis, Pharyngitis, Esophagitis and Esophageal obstruction	<ul style="list-style-type: none"> ✓ Brainstorming about Diseases of the alimentary tract ✓ Lecture on Diseases of the alimentary tract ✓ Providing short note on Diseases of the alimentary tract 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Equipped with methods of clinical examinations of Diseases of the alimentary tract ✓ understand and appreciate diagnostic methods, treatment and control of Diseases of the alimentary tract
6	3.2. Hypermobility and Hypomotility 3.3. Simple indigestion 3.4. Acute carbohydrate engorgement	<ul style="list-style-type: none"> ✓ Brainstorming about Diseases of the alimentary tract ✓ Lecture on Diseases of the alimentary tract ✓ Providing short note on Diseases of the alimentary tract 	<ul style="list-style-type: none"> Listen the lecture and take notes from the lecture Forward confusion/doubts in relation to the lecture Peer idea sharing Ask & answer question Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Equipped with methods of clinical examinations of Diseases of the alimentary tract ✓ understand and appreciate diagnostic methods, treatment and control of Diseases of the alimentary tract ✓

7	3.5. Distention, Ruminal Tympani	<ul style="list-style-type: none"> ✓ Brainstorming about Diseases of the alimentary tract ✓ Lecture on Diseases of the alimentary tract ✓ Providing short note on 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing 	<ul style="list-style-type: none"> ✓ Equipped with methods of clinical examinations of Diseases of the alimentary tract ✓ understand and
8	3.6. Enteritis, Diarrhea and Vomiting 3.7 Equine colic 3.8. Acute intestinal obstruction, Intussusception, Volvulus	<ul style="list-style-type: none"> ✓ Brainstorming about Diseases of the alimentary tract ✓ Lecture on Diseases of the alimentary tract ✓ Providing short note on Diseases of the alimentary tract 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Equipped with methods of clinical examinations of sick animals; ✓ understand and appreciate diagnostic methods, treatment and control of
9	Chapter IV: Principles of treatment of the GIT diseases 4. 1.Fluid and electrolyte therapy 4. 2.Relief of distension 4. 3.Restoration Rumen flora and correction of Acidosis and Alkalosis	<ul style="list-style-type: none"> ✓ Brainstorming about Principles of treatment of the GIT diseases ✓ Lecture on Principles of treatment of the GIT diseases ✓ Providing short note on Principles of treatment of the GIT diseases 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ understand and apply Principles of treatment of the GIT diseases

10	Chapter V: Diseases of the cardiovascular system 5.1 Principle of circulatory failure 5.2 Manifestation of circulatory failure 5.3 Pericarditis /TRP 5.4 Arterial thrombosis	<ul style="list-style-type: none"> ✓ Brainstorming about Diseases of the cardiovascular system ✓ Lecture on Diseases of the cardiovascular system ✓ Providing short note on Diseases of the cardiovascular system 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Equipped with methods of clinical examinations of Diseases of the cardiovascular system ✓ understand and appreciate diagnostic methods, treatment and control of Diseases of the cardiovascular system
11	5.5 Diseases of the Blood and Blood Forming Organs 5.5.1 Shock 5.5.2 Edema 5.5.3 Anemia	<ul style="list-style-type: none"> ✓ Brainstorming about Diseases of the cardiovascular system ✓ Lecture on Diseases of the cardiovascular system ✓ Providing short note on Diseases of the cardiovascular system 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Equipped with methods of clinical examinations of Diseases of the cardiovascular system ✓ understand and appreciate diagnostic methods, treatment and control of Diseases of the cardiovascular system
12	Chapter VI: Diseases of the respiratory system 6.1 Pneumonia 6.2 Pneumothorax / Emphysema 6.3 Pleurisy	<ul style="list-style-type: none"> ✓ Brainstorming about Diseases of the respiratory system ✓ Lecture on Diseases of the respiratory system ✓ Providing short note on Diseases of the respiratory system 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading 	<ul style="list-style-type: none"> ✓ Equipped with methods of clinical examinations of Diseases of the respiratory system ✓ understand and appreciate diagnostic methods, treatment and control of Diseases

			assignment	of the respiratory system
13	Chapter VII: Disease of the Urinary system 7.1 Renal ischemia 7.2 Nephritis 7.3 Cystitis 7.4 Urolithiasis	<ul style="list-style-type: none"> ✓ Brainstorming about Disease of the Urinary system ✓ Lecture on Disease of the Urinary system ✓ Providing short note on Disease of the Urinary system 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Equipped with methods of clinical examinations of Disease of the Urinary system ✓ understand and appreciate diagnostic methods, treatment and control of Disease of the Urinary system
14	Chapter VIII: Diseases of the Nervous system 8.1 Manifestation of disease of nerves system 8.2 Encephalitis 8.3 Encephalomalacia 8.4 Meningitis	<ul style="list-style-type: none"> ✓ Brainstorming about Diseases of the Nervous system ✓ Lecture on Diseases of the Nervous system ✓ Providing short note on Diseases of the Nervous system 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Equipped with methods of clinical examinations of Diseases of the Nervous system ✓ understand and appreciate diagnostic methods, treatment and control of Diseases of the Nervous system
15	Chapter IX: Disease of the Musculo-skeletal system 9.1 Myopathy 9.2 Myositis 9.3 Arthritis and synovitis Chapter X: Diseases of the skin and conjunctiva 10.1 Photosensiti	<ul style="list-style-type: none"> ✓ Brainstorming about Disease of the Musculo-skeletal system & Diseases of the skin and conjunctiva ✓ Lecture on Disease of the Musculo-skeletal system & Diseases of the skin and conjunctiva ✓ Providing short note on Disease of the Musculo-skeletal system & Diseases 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Equipped with methods of clinical examinations of Disease of the Musculo-skeletal system & Diseases of the skin and conjunctiva ✓ understand and appreciate diagnostic methods,

	zation 10. 2Dermatitis 10.3 Ocular disease	of the skin and conjunctiva		treatment and control of Disease of the Musculo- skeletal system and Diseases of the skin and conjunctiva
16	Final exam			

4.2.assessment strategies and techniques and courses policy

Assessment

- Quiz7%
- Test.....8%
- Assignment.....10%
- Mid exam.....25%
- Final exam.....50%
- Total100%

Courses policy

- **Student has to**
 - Attend 85% of the class
 - take all continuous assessment and mid exam
 - Take final exam
 - Respect all rules and regulation of the university

1. References

1. Rdstits, O.M, Gay, C.C., Hinchcliff W.K., Constable, P.D. (2007). Veterinary Medicine: A text book of the disease of cattle, horses, sheep, pigs and goats, 10th ed. Elsever, london.
2. The Merk Veterinary manual (2000).Merck &CO.INC White house station, New jersey, USA
3. Seifert, H.S.M,(1996). Tropical animal health George-August university, kluver, Academic publication Dordrecht, Germany
4. Bradfor, p.s, (1996). Large Animal internal medicine, 2nd, edn. St. louis, Missouri USA
5. Howard (1981). Current veterinary therapy; Food Animal practice. WB saunders, Philadelphia USA.
6. Hungerford. r.G. (1975). Diseases of Livestock 9th ed. Sydney, Australia

7. Parker, W.H (1980). Health and disease in farm animals/3rd ed. pajamos press, oxford England

8. Sewll, M.M.H. and Brockles by, D.W. (1990). Handbook on animal Diseases in tropics, 4th ed. Baillere tindall, London.

Approval section

	Name	Signature
Chair holder		
Department head		

Large animal Medicine



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Animal disease and preventive medicine				
Module No.	06				
Course Title	Large animal Medicine				
Course code	Vtsc3062				
Credits hour (Cr hr) ECTS	Cr Hrs=3	Lecture Hrs=3	Laboratory=0	Home study=7	Cp/ECTS=5
Semester	II				
Year	III				
Target group	Bachelor Veterinary Science				
Pre-requisites	Veterinary General medicine				
Status of the course	Compulsory				
Instructor name and address					
2.Course description	The etiology, pathogenesis, clinical findings, diagnosis, treatment, prevention and control of diseases of cattle, sheep, goats, and swine caused by bacteria, viruses, fungi, rickettsia, and nutritional deficiency with particular emphasis on diseases of major economic and public health importance in the tropics.				

3. Course objectives

At the end of the course students should:

- Be familiar with specific infectious and non-infectious diseases of large animals found in the tropics

- Be able to diagnose diseases based on clinical, laboratory and epidemiological evidences
- Possess the basic knowledge to treat, control and prevent diseases of farm animals
- Be familiar with zoonotic diseases emanating from large animal

4.Syllabous Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	1. Bacterial diseases 1.1. Anthrax 1.2. Clostridia diseases 1.3. Pasteurellosis	✓ Brainstorming about Anthrax. Clostridia diseases,. Pasteurellosis ✓ Lecture on Anthrax. Clostridia diseases,. Pasteurellosis ✓ Providing short note on Anthrax. Clostridia diseases,. Pasteurellosis	✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/do ubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	Understand the method of diagnosis, treatment and control of Anthrax. Clostridia diseases, Pasteurellosis
2	1.5. Tuberculosis 1.6. Listeriosis	✓ Brainstorming about Tuberculosis, Listeriosis ✓ Lecture on Tuberculosis, Listeriosis ✓ Providing short note on Tuberculosis, Listeriosis	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question	Understand the method of diagnosis , treatment and control of Tuberculosis, Listeriosis

			✓ Take part on reading assignment	
3	1.7. Leptospirosis 1.8. John's Disease 1.9. Brucellosis	<ul style="list-style-type: none"> ✓ Brainstorming about Leptospirosis, John's Disease, Brucellosis ✓ Lecture on Leptospirosis ✓ John's Disease, Brucellosis Providing short note on Leptospirosis John's Disease, Brucellosis 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	Understand the method of diagnosis , treatment and control of Leptospirosis, John's Disease, Brucellosis
4	1.10. Infectious kerato conjunctivitis 1.11. Mycoplasmal diseases 1.12. Dermatophilosis	<ul style="list-style-type: none"> ✓ Brainstorming about Infectious kerato conjunctivitis, Mycoplasmal diseases, Dermatophilosis ✓ Lecture on Infectious kerato conjunctivitis, Mycoplasmal diseases, Dermatophilosis ✓ Providing short note on Infectious kerato conjunctivitis, Mycoplasmal diseases, Dermatophilosis 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	Understand the method of diagnosis , treatment and control of Infectious kerato conjunctivitis, Mycoplasmal diseases, Dermatophilosis
5	1.13 Colibacillosis	Brainstorming about	✓ Listen the lecture	Understand the

	1.14. Salmonellosis 1.15. Actinomycosis	Colibacillosis, Salmonellosis, Actinomycosis ✓ Lecture on Colibacillosis, Salmonellosis, Actinomycosis ✓ Providing short note on Colibacillosis, Salmonellosis, Actinomycosis	and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	method of diagnosis , treatment and control of Colibacillosis, Salmonellosis, Actinomycosis
6	1.16. Actinobacillosis 1.17. Ulcerative lymphangitis 1.18. Swine erysipelas	Brainstorming about Actinobacillosis, Ulcerative lymphangitis, Swine erysipelas Lecture on Actinobacillosis, Ulcerative lymphangitis, Swine erysipelas Providing short note on Actinobacillosis, Ulcerative lymphangitis, Swine erysipelas	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	Understand the method of diagnosis , treatment and control of Actinobacillosis, Ulcerative lymphangitis, Swine erysipelas
7	2. Rickettsia Diseases 2.1. Heart water 2.2. Anaplasmosis	✓ Brainstorming about Heart water and Anaplasmosis ✓ Lecture on Heart water and Anaplasmosis ✓ Providing short note on	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture	Understand the method of diagnosis , treatment and control of Heart water and Anaplasmosis

		Heart water and Anaplasmosis	<ul style="list-style-type: none"> ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	
8	3. Fungal diseases 3.1. Dermatophytosis 3.2. Ring worm	<ul style="list-style-type: none"> ✓ Brainstorming about Dermatophilosis & Ring worm ✓ Lecture on Dermatophytosis & Ring worm ✓ Providing short note on Dermatophytosis & Ring worm 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand the method of diagnosis , treatment and control of Dermatophilosis & Ring worm
9	4. Viral diseases 4.1. Foot and mouth disease 4.2. Pest des petitis ruminants	<ul style="list-style-type: none"> ✓ Brainstorming about Foot and mouth disease, Pest des petitis ruminants ✓ Lecture on Foot and mouth disease, Pest des petitis ruminants ✓ Providing short note on Foot and mouth disease, Pest des petitis ruminants 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	Understand the method of diagnosis , treatment and control of Foot and mouth disease, Pest des petitis ruminants
10	4.4. Malignant	<ul style="list-style-type: none"> ✓ Brainstorming about 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the 	Understand the

	<p>catarrhal fever</p> <p>4.5. Bovine viral diarrhea</p> <p>4.6 Infectious bovine rhinotracheitis</p>	<p>Malignant catarrhal fever, Bovine viral diarrhea, Infectious bovine rhinotracheitis</p> <p>✓ Lecture on Malignant catarrhal fever, Bovine viral diarrhea, Infectious bovine rhinotracheitis</p> <p>✓ Providing short note on Malignant catarrhal fever, Bovine viral diarrhea, Infectious bovine rhinotracheitis</p>	<p>lecture</p> <p>✓ Forward confusion/doubts in relation to the lecture</p> <p>✓ Pear idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>method of diagnosis , treatment and control of Malignant catarrhal fever, Bovine viral diarrhea, Infectious bovine rhinotracheitis</p>
11	<p>4.7. Sheep and Goat pox</p> <p>4.8. Lumpy Skin Disease</p> <p>4.9. Contagious ecthyma</p> <p>4.10. Papillomatosis</p>	<p>✓ Brainstorming about . Sheep and Goat pox, Lumpy Skin Disease, Contagious ecthyma,, Papillomatosis</p> <p>✓ Lecture on Sheep and Goat pox, Lumpy Skin Disease, Contagious ecthyma,, Papillomatosis</p> <p>✓ Providing short note on Sheep and Goat pox, Lumpy Skin</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward confusion/doubts in relation to the lecture</p> <p>✓ Pear idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>Understand the method of diagnosis , treatment and control of Sheep and Goat pox, Lumpy Skin Disease, Contagious ecthyma, Papillomatosis</p>

		Disease, Contagious ecthyma, Papillomatosis		
12	4.11. Rabies 4.12. Rift valley fever 4.13. Blue tongue	<ul style="list-style-type: none"> ✓ Brainstorming about Rabies , Rift valley fever, Blue tongue ✓ Lecture on Rabies , Rift valley fever, Blue tongue ✓ Providing short note on Rabies,, Rift valley fever, Blue tongue 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	Understand the method of diagnosis , treatment and control of Rabies , Rift valley fever, Blue tongue
13	4.14. Hog Cholera/ 4.15 African swine fever 4.16. Nairobi sheep disease 4.17. Maedi-visna	<ul style="list-style-type: none"> ✓ Brainstorming about Hog Cholera/, African swine fever, Nairobi sheep disease, Maedi-visna ✓ Lecture on Hog Cholera/, African swine fever, Nairobi sheep disease, Maedi-visna ✓ Providing short note on Hog Cholera/, African swine fever, Nairobi sheep disease, Maedi-visna 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	Understand the method of diagnosis , treatment and control of Hog Cholera/, African swine fever, Nairobi sheep disease, Maedi-visna
14	5.Prion protein 5.1. Scrapie	<ul style="list-style-type: none"> ✓ Brainstorming about Scrapie, Bovine 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture 	Understand the method of

	2.2. Bovine Spongiform Encephalopathy	<p>Spongiform Encephalopathy ,</p> <p>✓ Lecture on Scrapie, Bovine Spongiform Encephalopathy disease, Providing short note on Scrapie, Bovine Spongiform Encephalopathy disease,</p>	<p>✓ Forward confusion/doubts in relation to the lecture</p> <p>✓ Pear idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>diagnosis , treatment and control of Scrapie, Bovine Spongiform Encephalopathy disease,</p>
15	<p>6. Metabolic diseases</p> <p>4.1 Milk fever (peri Parturient paresis)</p> <p>4.2. Ketosis/pregnancy toxemia</p> <p>4.3. Copper deficiency</p> <p>4.4. Magnesium deficiency</p>	<p>✓ Brainstorming about , carbohydrate engorgement, Milk fever (peri Parturient paresis), Ketosis/pregnancy toxemia, Copper deficiency, magnesium deficiency</p> <p>Lecture on Scrapie, Milk fever (peri Parturient paresis), Ketosis/pregnancy toxemia, Copper deficiency, magnisium deficiency</p> <p>Providing short, Milk fever (peri Parturient paresis), Ketosis/pregnancy toxemia, Copper deficiency, magnesium deficiency</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward confusion/doubts in relation to the lecture</p> <p>✓ Pear idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>✓ Understand the method of diagnosis , treatment and control of Milk fever (peri Parturient paresis), Ketosis/pregnancy toxemia, Copper deficiency, magnesium deficiency</p>
16	Final exam			

4.2.assessment strategies and techniques and courses policy

Assessment

✓ Quiz	7%
✓ Test.....	8%
✓ Assignment.....	10%
✓ Mid exam.....	25%
✓ Final exam.....	50%
✓ Total	100%

Courses policy

Student has to

- ✓ Attend 85% of the class
- ✓ take all continuous assessment and mid exam
- ✓ Take final exam
- ✓ Respect all rules and regulation of the university

2. References

1. Radostits, O.M., D.C. Blood and C.C. Gay. 1994. Veterinary Medicine. 8th Ed. Bailliere Tindall, London.
2. Large Animal Internal Medicine, (Diseases of Horses, Cattle, Sheep, and Goats).2nd Ed. The C.V. Mosby Co. Philadelphia, USA.
3. Hungerford. T. G. 1991. Hungerford's Disease of Livestock. 9th Ed, McGraw-Hill Book Company. Sydney.
4. Howard, J.L. 1999. Current Veterinary Therapy, Food Animal Practice, W. B. Finders Publishers, USA.
5. Scott, D.W., W.H. Miller Jr. and C. Griffin. 1995. Muller and Kirk’s Small Animal Dermatology. 5th Ed. W.B. Saunders Co., Philadelphia

Approval section

	Name	Signature
Chair holder		
Department head		

Small Animal Medicine



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Animal Diseases and Preventive Medicine				
Module No.	06				
Course Title	Small animal Medicine				
Course code	Vtsc3063				
Credit Hrs/ECTS	Cr Hrs=2	Lecture Hrs=2	Laboratory=0	Home study=4	Cp/ECTS=3
Semester	II				
Year	III				
Pre-requisites	Veterinary General Medicine				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

The etiology, pathogenesis, clinical findings, diagnosis, treatment, prevention and control of diseases of small animals (Dog and Cat), caused by bacteria, viruses, fungi, rickettsia, and nutritional deficiency will be covered.

3. Objectives of the Courses

At the end of the course student should able to:

- Possess the essential information on diseases of small animals on which to approach a diagnosis
- Be able to devise appropriate strategies for treatment, prevention and control

4.Syllabus Components				
4.1.Course Contents, Methods, Strategies, and Learning Outcome				
Week	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	1. Infectious diseases 1.1 Rabies 1.2 Canine Distemper 1.3 Canine Parvovirus Disease	✓ Brainstorming about rabies. Canine distemper Pasteurellosis ✓ Lecture on rabies, canine distemper and canine parvovirus diseases ✓ Providing short note ✓ Revising of the session	✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question	✓ Understand diagnosis, treatment, prevention and control of rabies, canine distemper and canine parvovirus diseases
2	1.4 Canine Babesiosis 1.5 Canine Ehrlichiosis 1.6 Leptospirosis	✓ Brainstorming about canine babesiosis, Canine Ehrlichiosis and Leptospirosis ✓ Lecture on canine babesiosis, Canine Ehrlichiosis and Leptospirosis ✓ Providing short note	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading	Understand the diagnosis, treatment, prevention and control of canine babesiosis, Canine Ehrlichiosis and Leptospirosis

			assignment	
3	1.7 Toxoplasmosis 1.8 Canine Infectious Hepatitis 1.9 Feline Infectious Peritonitis	<ul style="list-style-type: none"> ✓ Brainstorming ✓ Lecture on Toxoplasmosis, Canine Infectious Hepatitis, Feline Infectious Peritonitis ✓ Providing short note 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	Understand the diagnosis , treatment and control of Toxoplasmosis, Canine Infectious Hepatitis, Feline Infectious Peritonitis
4,5	1.10 Brucellosis 1.11 Feline Panleukopenia 1.12 Feline Leukaemia 1.13 Systemic Mycoses 1.14 Haemobartonellosis	<ul style="list-style-type: none"> ✓ Brainstorming about Lecture on Brucellosis, Feline Panleukopenia, Feline Leukaemia, Systemic Mycoses and Haemobartonellosis ✓ Providing short note 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	Understand the diagnosis , treatment and control of Brucellosis, Feline Panleukopenia, Feline Leukaemia, Systemic Mycoses and Haemobartonellosis
6	2. Diseases of the	<ul style="list-style-type: none"> ✓ Brainstorming about 	<ul style="list-style-type: none"> ✓ Listen the lecture and 	<ul style="list-style-type: none"> ✓ Understand the

	<p>respiratory system</p> <p>2.1 Diagnostic approach to patients with respiratory diseases</p> <p>2.2 Diseases of the upper respiratory tract</p> <p>2.2.1 Rhinitis</p> <p>2.2.2 Tracheitis</p> <p>2.2.3 Brachycephalic airway obstruction</p>	<p>diseases of respiratory system</p> <p>✓ Lecture on Diagnostic approach to patients with respiratory diseases and Diseases of the upper respiratory tract (Rhinitis, Tracheitis, Brachycephalic airway obstruction)</p> <p>✓ Providing short note</p>	<p>take notes from the lecture</p> <p>✓ Forward confusion/doubts in relation to the lecture</p> <p>✓ Peer idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>different diagnostic approach for respiratory diseases</p> <p>✓ Understand the diagnosis, treatment and control of diseases of the upper respiratory tract (Rhinitis, Tracheitis, Brachycephalic airway obstruction)</p>
7	<p>2.3 Diseases of the lower respiratory tract</p> <p>2.3.1 Canine infectious tracheobronchitis,</p> <p>2.3.2 Feline allergic bronchitis,</p> <p>2.3.3 Pneumonia,</p> <p>2.3.4 Pleural effusion,</p> <p>2.3.5 Pulmonary edema.</p>	<p>✓ Brainstorming</p> <p>✓ Lecture on diseases of the lower respiratory tract, Canine infectious tracheobronchitis, Feline allergic bronchitis, Pneumonia, Pleural effusion, pulmonary edema.</p> <p>✓ Providing short note</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward confusion/doubts in relation to the lecture</p> <p>✓ Peer idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>Understand the diagnosis, treatment and control of Canine infectious tracheobronchitis, Feline allergic bronchitis, Pneumonia, Pleural effusion, pulmonary edema</p>

8	3. Diseases of the cardiovascular system 3.1 Heart failure 3.2 Feline cardiomyopathy 3.3 Heart worm disease	✓ Brainstorming diseases of cardiovascular disease ✓ Lecture on Heart failure, Feline cardiomyopathy and Heart worm disease ✓ Providing short note	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Understand the diagnosis, treatment and control of Heart failure, Feline cardiomyopathy and Heart worm disease
9	3.4 Congenital heart diseases 3.4.1 Patent ductus arteriosus, 3.4.2 Aortic stenosis, 3.4.3 Pulmonary stenosis, 3.4.4 Ventricular septal defect, 3.4.5 Atrial septal defect 3.4.6 Myocardial and pericardial diseases	✓ Brainstorming about congenital heart diseases ✓ Lecture Congenital heart diseases, Patent ductus arteriosus, Aortic stenosis, pulmonary stenosis, Ventricular septal defect, atrial septal defect, Myocardial and pericardial diseases ✓ Providing short note	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Understand the diagnosis, treatment and control of Patent ductus arteriosus, Aortic stenosis, pulmonary stenosis, Ventricular septal defect, atrial septal defect, Myocardial and pericardial diseases
	4. Diseases of the	✓ Brainstorming	✓ Listen the lecture and	Understand the

10	<p>Gastrointestinal System</p> <p>4.1 Diseases of the oral cavity</p> <p>4.1.1 Oral ulcers</p> <p>4.1.2 Oropharyngeal neoplasia</p> <p>4.1.3 Tonsillitis</p> <p>4.2 Esophageal diseases</p> <p>4.3 Diseases of the stomach</p> <p>4.3.1 Acute gastritis,</p> <p>4.3.2 Chronic gastritis,</p> <p>4.3.3 Gastric dilatation,</p> <p>4.3.4 Gastric neoplasia,</p> <p>4.3.5 Pyloric obstruction</p>	<p>diseases of the gastrointestinal System</p> <p>✓ Lecture on Diseases of the oral cavity, Oral ulcers, Oropharyngeal neoplasia, Tonsillitis, Esophageal diseases</p> <p>✓ Diseases of the stomach, Acute gastritis, Chronic gastritis, Gastric dilatation, Gastric neoplasia and Pyloric obstruction</p> <p>✓ Providing short note</p>	<p>take notes from the lecture</p> <p>✓ Forward confusion/doubts in relation to the lecture</p> <p>✓ Peer idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>diagnosis , treatment and control of major diseases of the gastrointestinal system</p>
11	<p>4.4 Intestinal diseases</p> <p>4.4.1 Diagnosis of intestinal diseases,</p> <p>4.4.2 Acute and Chronic</p>	<p>✓ Brainstorming on intestinal diseases</p> <p>✓ Lecture on</p> <p>✓ Providing short note</p> <p>Diagnosis of intestinal</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward confusion/doubts in relation</p>	<p>✓ Understand the diagnosis, treatment and control of acute and chronic diarrhea, intestinal</p>

	<p>diarrhea</p> <p>4.4.3 Intestinal obstruction</p> <p>4.5 Diseases of the large intestine.</p>	<p>diseases, Acute and Chronic diarrhea, Intestinal obstruction and Diseases of the large intestine.</p>	<p>to the lecture</p> <p>✓ Pear idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>obstruction and diseases of the large intestine.</p>
12	<p>5. Diseases of the Reproductive Tract</p> <p>5.1 Cystic Endometrial Hyperplasia</p> <p>5.2 Metritis</p> <p>5.3 Pseudopregnancy</p> <p>5.4 Genital emergencies in females</p> <p>5.4.1 Dystocia</p> <p>5.4.2 Uterine prolapse</p> <p>5.4.3 Eclampsia</p> <p>5.5 Genital emergencies in males</p> <p>5.5.1 Paraphymosis,</p> <p>5.5.2 Trauma to the penis,</p> <p>5.5.3 Orchitis,</p> <p>5.5.4 Prostatic</p>	<p>✓ Brainstorming about diseases of the reproductive tract</p> <p>✓ Lecture on Cystic Endometrial Hyperplasia, Metritis, Pseudopregnancy, Genital emergencies in females, Dystocia, Uterine prolapse, Eclampsia, Genital emergencies in males, Paraphymosis, Trauma to the penis, Orchitis and Prostatic enlargement.</p> <p>✓ Providing short note</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward confusion/doubts in relation to the lecture</p> <p>✓ Pear idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>✓ Understand the diagnosis , treatment and control of Cystic Endometrial Hyperplasia, Metritis, Pseudopregnancy, Genital emergencies in females, Dystocia, Uterine prolapse, Eclampsia, Genital emergencies in males, Paraphymosis, Trauma to the penis, Orchitis and Prostatic enlargement.</p>

	enlargement.			
13	<p>6. Diseases of the Urinary System</p> <p>6.1 Renal failure(Acute renal failure, Chronic renal failure)</p> <p>6.2 Cystitis</p> <p>6.3 Bladder tumor</p>	<p>✓ Brainstorming about diseases of the urinary System</p> <p>✓ Lecture on Renal failure(Acute renal failure, Chronic renal failure), Cystitis and Bladder tumor</p> <p>✓ Providing short note</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward confusion/doubts in relation to the lecture</p> <p>✓ Pear idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>✓ Understand the diagnosis , treatment and control of Renal failure (Acute renal failure, Chronic renal failure), Cystitis and Bladder tumor</p>
14	<p>7. Diseases of the Hemolymphatic and Musculoskeletal System</p> <p>7.1 Diseases of the Hemolymphatic system (Anemia, Regenerative anemia, Nonregenerative anemia, Autoimmune hemolytic anemia, Lymphoma)</p> <p>7.2 Diseases of the musculoskeletal system (Chronic hip dysplasia, Arthritis, Infectious Arthritis, Non-Infectious Arthritis, Rickets)</p>	<p>✓ Brainstorming about diseases of the hemolymphatic and musculoskeletal System</p> <p>✓ Lecture on Diseases of the Hemolymphatic system (Anemia, Regenerative anemia, Nonregenerative anemia, Autoimmune hemolytic anemia, Lymphoma), Diseases of the musculoskeletal system (Chronic hip dysplasia, Arthritis, Infectious Arthritis, Non-Infectious Arthritis, Rickets)</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward confusion/doubts in relation to the lecture</p> <p>✓ Pear idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>✓ Understand the diagnosis , treatment and control of Anemia, diseases of the musculoskeletal system (Chronic hip dysplasia, Arthritis, Infectious Arthritis, Non-Infectious Arthritis, Rickets)</p>

		✓ Providing short note		
15	8. Diseases of the Eye and Ear 8.1 Diseases of the eye (Physical Examination of the eye, Common ocular abnormalities of dog and cat, Ocular manifestation of systemic diseases, Ocular therapeutics) 8.2 Diseases of the ear (Otitis externa and media)	✓ Brainstorming diseases of the Eye and Ear ✓ Lecture on Diseases of the eye (Physical Examination of the eye, Common ocular abnormalities of dog and cat, Ocular manifestation of systemic diseases, Ocular therapeutics) ✓ Diseases of the ear (Otitis externa and media) ✓ Providing short note	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Understand the diagnosis, treatment and control of diseases of the eye and ear of dog and cat.
16	9. Small Animal Toxicology 9.1 Introduction (Clinical signs, Laboratory examination of toxicity, Treatment of toxicosis) 9.2 Common toxicants in small animal medicine: Inorganic toxicants (Acids and alkalis, Lead, Carbon monoxide),	✓ Brainstorming about animal animal toxicology ✓ Lecture on Introduction (Clinical signs, Laboratory examination of toxicity, Treatment of toxicosis) ✓ Common toxicants in small animal medicine: Inorganic	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Understand the diagnosis , treatment and control of different types of toxicosis in small animals

	Rodenticides (Strychnine, Zinc phosphide, Anticoagulants (warfarin)), Insecticides	toxicants (Acids and alkalis, Lead, Carbon monoxide), Rodenticides		
16	Final exam	✓	✓	

4.2.assessment strategies and techniques and courses policy

Assessment

- Quiz7%
- Test.....8%
- Assignment.....10%
- Mid exam.....25%
- Final exam.....50%
- Total100%

Courses policy

Student has to

- ✓ Attend 85% of the class
- ✓ take all continuous assessment and mid exam
- ✓ Take final exam
- ✓ Respect all rules and regulation of the university

References

- ✓ Aiello.S.E.1998. The Merck Veterinary Manual. 8th ed. Merck and CO., INC., Whitehouse Station, N.J.,U.S.A.
- ✓ Ettinger,S.J.(1989) . Textbook of Veterinary internal Medicine –disease of dogs and cats. Volume I, W.B. Saunders Company
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- ✓ Miller Jr, W.H., Griffin, C.E. and Campbell, K.L., 2012. Muller and Kirk's small animal dermatology.

Elsevier Health Sciences.

- ✓ Crawley-Low, J., 2004. Veterinary medicine books recommended for academic libraries. Journal of the Medical Library Association, 92(4), p.473.
- ✓ Nelson, R.W. and Couto, C.G., 2019. Small Animal Internal Medicine-E-Book. Elsevier.
- ✓ Williams III, R.J., Muir, W.W., John, A.E., Samper, J.C., Atkinson, C.T., Thomas, N.J., Hunter, B., Nelson, R.W., Couto, C.G., Reagan, W.J. and Irizarry, A.R., 2009. New books in the McDowell Veterinary Library.
- ✓ Ettinger, S.J., Feldman, E.C. and Cote, E., 2017. Textbook of Veterinary Internal Medicine-eBook. Elsevier health sciences.

Approval section

	Name	Signature
Chair holder		
Department head		

Veterinary Clinical Diagnosis



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary clinical diagnosis and practice				
Module No.	07				
Course Title	Veterinary Clinical Diagnosis				
Course code	Vtsc3071				
Credit Hrs/ECTS	Cr Hrs=3	Lecture Hrs=2	Practical=1Hr	Home study=7	Cp/ECTS=5
Semester	I				
Year	III				
Pre-requisites	No				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

Lecture: The course deals with scientific methods of examining healthy animals involving restraint, history taking, determination of temperature, pulse and respiration values, and status of the visible mucous membranes. The art and skills of physical examination methods such as inspection, palpation, percussion, and auscultation are discussed in detail. Methods of sample collection will also be handled. Techniques and procedures are practiced thoroughly in the clinic on normal animals of various species kept for this purpose. The course also involves systematic physical examination of body systems including the skin, the respiratory, cardiovascular, digestive, urinary, lymphatic, musculoskeletal and nervous; and further drill in the techniques and procedures in the acquired skill supplemented by clinical diagnosis, laboratory examination findings on samples like blood, feces etc. and use some special diagnostic tests like allergic, electrocardiography, etc, is indicated and demonstrated.

Practical : Familiarization with clinical instruments and methods of animal restraining, methods of physical

clinical examination, noting vital signs, physical clinical examinations of organs and systems of the body, application of laboratory instruments, practicing routes of drug administration, and taking samples from the body of domestic animals.

3.Objectives of the Courses

At the end of the course student should able to:

- apply methods of animal handling/restraint and are able to take history
- measure and analyze vital parameters (temperature, respiration and pulse)
- describe and apply methods and techniques of physical clinical examination
- conduct physical clinical examination to detect clinical signs take appropriate sample

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1	<p>Chapter 1 :General introduction</p> <p>1.1. Diagnosis</p> <p>1.2. Symptoms, Clinical signs and pathognomonic signs and syndromes</p>	<p>Introduce general concepts about clinical diagnosis</p> <p>Brainstorming</p> <p>Lecture</p> <p>Providing short note</p> <p>Case study</p> <p>Clinical demonstration</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p>	<p>Understand about the concept of diagnosis, symptom, clinical signs and syndromes</p> <p>Understand about the concept of veterinary clinical diagnosis</p>
1	<p>Chapter 2: .Methods of restraint</p> <ul style="list-style-type: none"> • Physical restraint • Chemical restraint • Verbal/moral restraint 	<p>✓ Introduce methods of restraining</p> <p>✓ Brainstorming</p> <p>✓ Lecture on types of restraining</p> <p>✓ Providing short note methods of restraining</p> <p>✓ Case study</p> <p>✓ Clinical demonstration</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Pear idea sharing</p> <p>✓ Ask & answer question</p>	<p>Understand methods of restraint</p> <ul style="list-style-type: none"> • Physical restraint • Chemical restraint <p>✓ Verbal/moral restraint</p>

			✓ Take part on reading assignment	
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<p>3</p>	<p>Chapter 3: History taking (Anamnesis) 3.1. Immediate history 3.2. Past history 3.3. Management history and Examination of the environment</p>	<p>✓ Introduce history taking ✓ Brainstorming ✓ Lecture on types of history taking ✓ Providing short note On types of history and environmental examination Case study Clinical demonstration</p>	<p>✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion ✓ Ask and answering</p>	<p>Understand History taking (Anamnesis) ✓ Describe Types Of History taking and Examination of the environment</p>
<p>3</p>	<p>Chapter 4: Physical examination of individual animal 4.1. Inspection 4.2. Palpation 4.3. Percussion 4.4. Auscultation 4.5. Test puncture</p>	<p>✓ Lecture on physical examination ✓ Brainstorming ✓ Providing short note on Physical examination of individual animal case study clinical demonstration</p>	<p>✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment ✓ Pear idea sharing</p>	<p>Understand Physical examination of individual animal Describe the types of physical examination</p>

4-5	Chapter5: Examination of the herd 5.General clinical examination 5.1. Physical body condition 5.2. Gait 5.3 Body temperature 5.4.Respiration/breathing rate 5.5. Dyspnea 5.6. Abnormal respiratory sounds 5.7. Physical examination of the lung area	Introduce Examination of the herd ✓ Lecture on General clinical examination ✓ Brainstorming ✓ Provide short note on General clinical examination ✓ Discussion ✓ Case study ✓ Clinical demonstration	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	understand Examination of the herd understand General clinical examination, understand Physical body condition and Gait
6	Chapter 6: Examination of cardiovascular system	✓ Lecture on examination of cardiovascular system ✓ Provide short note ✓ Pear idea sharing ✓ Case study ✓ Clinical demonstration	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	✓ Understand abnormalities of cardiovascular system and examination methods
7-9	Chapter 7: Examination of the alimentary tract 7.1.Abnormalities of GIT 7.2.Abnormalities of prehension, mastication and swallowing/deglutition 7.3 Vomiting, eructation,	✓ Lecture on abnormalities of GIT and methods of examination ✓ Provide short note ✓ Class discussion	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading	✓ Understand abnormalities of alimentary tract ✓ Describe methods of GIT

	tenesmus, diarrhea and constipation 7.4 Motility of alimentary tract 7.5 Assessment of appetite 7.6 Examination of each segment of GIT	<ul style="list-style-type: none"> ✓ Case study ✓ Clinical demonstration 	assignment	examination
10	Chapter 8: Examination of skin and associated structures and conjunctiva	<ul style="list-style-type: none"> ✓ Introduce Examination of skin ✓ Providing short note ✓ Class discussion ✓ Brainstorming ✓ Case study ✓ Clinical demonstration 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork 	<ul style="list-style-type: none"> ✓ Understand about Examination of skin and associated structures and conjunctiva ✓ Describe skin abnormalities
11	Chapter 9. Examination of urinary system 9.1. Manner of urination 9.2. Physical clinical examination of the urinary tract 9.3. Examination of urine	<ul style="list-style-type: none"> Introduce on urinary system Lecture on examination of urinary system Providing short note Discussion Case study Clinical demonstration 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork 	Understand abnormalities of urinary system and Examination of urinary system,

12-13	Chapter10 : Examination of reproductive system 10.1 The female reproductive system 10.2Vulva and vagina Cervix, uterus and ovaries 10. 3The male reproductive system 10.4 The male reproductive system 10.5Scrotum and testis 10.6 Penis and prepuce	✓ Lecture on examination of reproductive system ✓ Class discussion ✓ Brainstorming ✓ Case study ✓ Clinical demonstration	✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork	Understand about abnormalities of reproductive system and Examination of reproductive system,
14	12.2 Chapter 12: Examination of musculoskeletal system	✓ Lecture on examination of musculoskeletal system ✓ Class discussion ✓ Brainstorming ✓ Provide short note ✓ Case study ✓ Clinical demonstration	✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork	Understand about abnormalities of musculoskeletal system and Examination of musculoskeletal system

15	<p>Chapter 13: Examination of nervous system</p> <p>Chapter 14 Diagnostic approach to the diseases</p>	<p>Lecture on examination of the nerves system</p> <p>✓ Providing short notes</p> <p>✓ Case study</p> <p>✓ Clinical demonstration</p> <p>Lecture on different diagnostic approaches system</p> <p>Brian storming</p> <p>Providing short notes</p> <p>Case Study</p> <p>Clinical demonstration</p>	<p>✓ Listen lecture and take notes from the lecture</p> <p>✓ Forward all doubts relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>Group discussion and classwork</p>	<p>Understand abnormalities of nerves system</p> <p>Understand about Examination of nervous system</p> <p>Understand the different diagnostic approaches</p> <p>Clinical diagnosis</p> <p>Laboratory diagnosis etc</p>
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16	Final exam			
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4.2.assessment strategies and techniques and courses policy

Assessment	
• Quiz	7%
• Test.....	8%
• Assignment.....	10%
• Mid exam.....	25%
• Final exam.....	50%
• Total	100%

Courses policy	
3. Student has to	
<ul style="list-style-type: none"> • Attend 85% of the class • take all continuous assessment and mid exam • Take final exam • Respect all rules and regulation of the university 	

References	
<ul style="list-style-type: none"> • Radostitts, O.M., D.C. Blood, & C.C. Gay. 1994, Veterinary Medicine, 8th Ed., Bailliere Tindall, London. 	
<ul style="list-style-type: none"> • Kelly, W.R. 1975. Veterinary Clinical diagnosis, 2nd Ed., Bailliere Tindal & Casell, London. 	
<ul style="list-style-type: none"> • Andrews, A.H. 1990. Outline of Clinical Diagnosis in Cattle, Butterworths and Company London. 	

- Pinsent, P.J.N. & C.J. Fuller. 1997. Outline of Clinical Diagnosis in Horse. Blackwell Science, Oxford, U

4. Propose practical activity for veterinary clinical diagnosis

- The student will be Practiced methods of healthy animal handling/restraint and are able to take history at veterinary teaching clinic
- The student will be Practiced measuring and analyzing vital parameters (temperature, respiration and pulse)
- The student will be Practiced how to describe and apply methods and techniques of physical clinical examination on healthy animal to detect clinical signs
- The student will be took appropriate sample for laboratory diagnosis (fecal sample, blood sample, rumen fluid etc.)
- The student will be Practiced different drug delivery methods in veterinary teaching clinic
- The student will be visited different veterinary clinics in and around Dahirdar city.

Approval section

	Name	Signature
Chair holder		
Department head		

Veterinary clinical practice I



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

Course Information					
Module Name	Veterinary laboratory and clinical diagnosis				
Module No.	07				
Course Title	Veterinary clinical practice I				
Course code	Vtsc3072				
Credits hour (Cr hr) ECTS	Cr Hrs=1	Lecture Hrs=0	Practical =1	Home study=3	Cp/ECTS=2
Semester	II				
Year	III				
Target group	Bachelor Veterinary Science				
Pre-requisites	Veterinary clinical diagnosis				
Status of the course	Compulsory				
Instructor name and address					
2.Course description					
2.Course description					
<p>The course deals with scientific methods of examining diseased animals involving restraint, history taking, determination of temperature, pulse and respiration values, and status of the visible mucous membranes. The art and skills of physical examination methods such as inspection, palpation, percussion, and auscultation are discussed in detail. Methods of sample collection will also be handled. Techniques and procedures are practiced thoroughly in the clinic on diseased animals of various species that comes to veterinary clinic for various disease complains. The course also involves systematic physical examination of body systems including the skin, the respiratory, cardiovascular,</p>					

digestive, urinary, lymphatic, musculoskeletal and nervous; and further drill in the techniques and procedures in the acquired skill supplemented by clinical diagnosis, laboratory examination findings on samples like blood, feces etc. and use some special diagnostic tests like allergic, electrocardiography, etc, is indicated and demonstrated.

The course also helps to the student familiarize with clinical instruments and methods of animal restraining, methods of physical clinical examination, noting vital signs, physical clinical examinations of organs and systems of the body, application of laboratory instruments, practicing routes of drug administration, and taking samples from the body of domestic animals. supervised by course coordinator and other instructors on duty

3. Course objectives

At the end of the course students should:

- Develop skills and gain experience in the primary care of farm animals and pets,
- Learn and practice effective client communications skills,
- Practice how to take/record a thorough medical history,
- Practice methods of case handling/restraint and are able to take history
- Practice measuring and analyzing vital parameters (temperature, respiration and pulse)
- Practice , describe and apply methods and techniques of physical clinical examination to detect clinical signs
- Take appropriate sample for laboratory diagnosis (fecal sample, blood sample, rumen fluid etc.)
- Practice different drug delivery methods

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	Approaches of communication with the owner of the animal	✓ practice how to communicate with owners	<ul style="list-style-type: none"> ✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ pear idea sharing ✓ Ask & answer question 	✓ Familiarized with approaches of communication of owners

2	History taking and clinical examination of cases presented to the clinic	<ul style="list-style-type: none"> ✓ Practice History taking and clinical examination of cases presented to the clinic ✓ Observation of clinical cases 	<ul style="list-style-type: none"> ✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question 	<ul style="list-style-type: none"> ✓ Familiarized with History taking and clinical examination of cases presented to the clinic
3	History taking and clinical examination of cases presented to the clinic	<ul style="list-style-type: none"> ✓ practice History taking and clinical examination of cases presented to the clinic ✓ Observation of clinical cases 	<ul style="list-style-type: none"> ✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question 	<ul style="list-style-type: none"> ✓ Familiarized with History taking and clinical examination of cases presented to the clinic
4	Diagnosis of cases encountered during Week 1 to 3 & (Assessment 1)		<ul style="list-style-type: none"> • Case presentation in group • Answer questions 	<ul style="list-style-type: none"> • Ability to appropriately diagnose the case
5	History taking and clinical examination of cases presented to the clinic	<ul style="list-style-type: none"> ✓ practice History taking and clinical examination of cases presented to the clinic ✓ Observation of clinical cases 	<ul style="list-style-type: none"> ✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question 	<ul style="list-style-type: none"> ✓ Familiarized with History taking and clinical examination of cases presented to the clinic
6	History taking and clinical examination of cases presented to the	<ul style="list-style-type: none"> ✓ practice History taking and clinical examination of cases 	<ul style="list-style-type: none"> ✓ Observation of clinical cases 	<ul style="list-style-type: none"> ✓ Familiarized with History taking and clinical

	clinic	presented to the clinic ✓ Observation of clinical cases	✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question	examination of cases presented to the clinic
7	Diagnosis of cases encountered during Week 5 to 6 & (Assessment 2)		✓ Case presentation in group ✓ Answer questions	• Ability to appropriately diagnose the case
8	History taking and clinical examination of cases presented to the clinic	✓ practice History taking and clinical examination of cases presented to the clinic ✓ Observation of clinical cases	✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question	✓ Familiarized with History taking and clinical examination of cases presented to the clinic
9	History taking and clinical examination of cases presented to the clinic	✓ practice History taking and clinical examination of cases presented to the clinic ✓ Observation of clinical cases	✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question	✓ Familiarized with History taking and clinical examination of cases presented to the clinic
10	Diagnosis of cases encountered during Week 8 & 9 (Assessment 3)		• Case presentation in group • Answer questions	• Ability to appropriately diagnose the case
11	History taking and clinical examination of cases presented to the clinic	✓ Brainstorming History taking and clinical examination of cases presented to	✓ Observation of clinical cases ✓ Forward all	✓ Familiarized with History taking and clinical examination of

		the clinic ✓ Observation of clinical cases	confusion/doubts ✓ peer idea sharing ✓ Ask & answer question	cases presented to the clinic
12	History taking and clinical examination of cases presented to the clinic	✓ Brainstorming History taking and clinical examination of cases presented to the clinic ✓ Observation of clinical cases	✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question	✓ Familiarized with History taking and clinical examination of cases presented to the clinic
13	Diagnosis of cases encountered during Week 8 &9 (Assessment 2)		• Case presentation in group • Answer questions	• Ability to appropriately diagnose the case
14	Final exam	✓ History taking and Clinical diagnosis of cases	✓ Individual oral examination	✓ Ability to appropriately diagnose the case
15	Final exam	✓ History taking and Clinical diagnosis of cases	✓ Individual oral examination	✓ Ability to appropriately diagnose the case
16	Final exam	✓ History taking and Clinical diagnosis of cases	✓ Individual oral examination	✓ Ability to appropriately diagnose the case

4.2.assessment strategies and techniques and courses policy

Assessment

- Clinic attendance_____10%
- Case presentation in group_____40%
- Individual oral examination_____50%
- Total100%

Courses policy		
Student has to		
<ul style="list-style-type: none"> ✓ Attend 85% of the clinic ✓ Take all continuous assessment and mid exam ✓ Take final exam ✓ Respect all rules and regulation of the university 		
References		
1. Radostits, O.M., D.C. Blood and C.C. Gay. 1994. Veterinary Medicine. 8th Ed. Bailliere Tindall, London.		
2. Large Animal Internal Medicine, (Diseases of Horses, Cattle, Sheep, and Goats). 2nd Ed. The C.V. Mosby Co. Philadelphia, USA.		
3. Hungerford. T. G. 1991. Hungerford's Disease of Livestock. 9th Ed, McGraw-Hill Book Company. Sydney.		
4. Howard, J.L. 1999. Current Veterinary Therapy, Food Animal Practice, W. B. Finders Publishers, USA.		
5. Scott, D.W., W.H. Miller Jr. and C. Griffin. 1995. Muller and Kirk's Small Animal Dermatology. 5th Ed. W.B. Saunders Co., Philadelphia		
6. Robinson, N.E. 1997. Current Therapy in Equine Medicine. W.B. Saunders Co., Philadelphia		
7. Aiello.S.E.1998. The Merck Veterinary Manual. 8th ed. Merck and CO., INC., Whitehouse Station, N.J., U.S.A		
Approval section		
	Name	Signature
Chair holder		
Department head		

Veterinary clinical practice II



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information					
Module Name	Veterinary clinical diagnosis and practice				
Module No.	07				
Course Title	Veterinary clinical practice II				
Course code	Vtsc4073				
Credits hour (Cr hr) ECTS	Cr Hrs=1	Lecture Hrs=0	practical=1	Home study=3	Cp/ECTS=2
Semester	I				
Year	IV				
Target group	Bachelor Veterinary Science				
Pre-requisites	Veterinary clinical diagnosis & Veterinary Clinical practice I				
Status of the course	Compulsory				
Instructor name and address					
2.Course description					
<p>The course deals with scientific methods of examining diseased animals involving restraint, history taking, determination of temperature, pulse and respiration values, and status of the visible mucous membranes. The art and skills of physical examination methods such as inspection, palpation, percussion, and auscultation are discussed in detail. Methods of sample collection will also be handled. Techniques and procedures are practiced thoroughly in the clinic on diseased animals of various species that comes to veterinary clinic for various disease complains. The course also involves systematic physical examination of body systems including the skin, the respiratory, cardiovascular, digestive, urinary, lymphatic, musculoskeletal and nervous; and further drill in the techniques and</p>					

procedures in the acquired skill supplemented by clinical diagnosis, laboratory examination findings on samples like blood, feces etc. and use some special diagnostic tests like allergic, electrocardiography, etc, is indicated and demonstrated.

The course also helps to the student familiarize with clinical instruments and methods of animal restraining, methods of physical clinical examination, noting vital signs, physical clinical examinations of organs and systems of the body, application of laboratory instruments, practicing routes of drug administration, and taking samples from the body of domestic animals. Supervised by course coordinator and other instructors on duty

3. Course objectives

At the end of the course students should:

- Develop skills and gain experience in the primary care of farm animals, pets, and poultry
- practice effective client communications skills
- Improve & Practice how to take/record a thorough medical history
- Independently Practice methods of case handling/restraint and are able to take history
- Independently Practice measuring & analyzing vital parameters (temperature, respiration & pulse)
- Independently Practice, describe & apply methods & techniques of physical clinical examination to detect clinical signs
- Take appropriate sample for laboratory diagnosis (fecal sample, blood sample, rumen fluid etc.)
- Independently Practice different drug delivery methods
- Independently conduct quality veterinary services: diagnosis, treatment, recommend control and prevention of diseases
- Conduct surgical operations & vaccinations independently.

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	✓ Develop skills and gain experience in the primary care of farm animals, pets, and poultry, restraining techniques	✓ Practice Appropriate retraining animal, poultry & pet,	✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer	✓ Familiarized with how to care for farm animal, poultry & pet, restraining

			question	
2	✓ Practice effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases ✓	✓ Conduct effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination diagnosis, treatment, recommend control and prevention of diseases	<ul style="list-style-type: none"> ✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question 	✓ Familiarized with effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination diagnosis, treatment, recommend control and prevention of diseases
3	✓ Practice effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases	✓ Conduct effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination diagnosis, treatment, recommend control and prevention of diseases	<ul style="list-style-type: none"> ✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question 	✓ Familiarized with effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination diagnosis, treatment, recommend control and prevention of diseases
4	Diagnosis of cases encountered during Week 1 to 3 & (Assessment 1)		<ul style="list-style-type: none"> • Case presentation in group • Answer questions 	• Ability to appropriately diagnose the case
5	✓ Practice effective client	✓ Conduct effective client	✓ Recording of the case	✓ Familiarized with effective client

	communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases	communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases	<ul style="list-style-type: none"> ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question 	communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases
6	✓ Practice effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases	✓ Conduct effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases	<ul style="list-style-type: none"> ✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question 	✓ Familiarized with effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases
7	Diagnosis of cases encountered during Week 5 to 6 & (Assessment 2)		<ul style="list-style-type: none"> • Case presentation in group • Answer questions 	• Ability to appropriately diagnose the case
8	✓ Practice effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases	✓ Conduct effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases	<ul style="list-style-type: none"> ✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts 	✓ Familiarized with effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases

	physical examination, diagnosis, treatment, recommend control and prevention of diseases	physical examination diagnosis, treatment, recommend control and prevention of diseases	<ul style="list-style-type: none"> ✓ peer idea sharing ✓ Ask & answer question 	physical examination diagnosis, treatment, recommend control and prevention of diseases
9	<ul style="list-style-type: none"> ✓ Practice effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases 	<ul style="list-style-type: none"> ✓ effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination diagnosis, treatment, recommend control and prevention of diseases 	<ul style="list-style-type: none"> ✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question 	<ul style="list-style-type: none"> ✓ Familiarized with effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination diagnosis, treatment, recommend control and prevention of diseases
10	Diagnosis of cases encountered during Week 8 &9 (Assessment 3)		<ul style="list-style-type: none"> • Case presentation in group • Answer questions 	<ul style="list-style-type: none"> • Ability to appropriately diagnose the case
11	<ul style="list-style-type: none"> ✓ Practice effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of 	<ul style="list-style-type: none"> ✓ Conduct effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination diagnosis, treatment, recommend control and prevention of 	<ul style="list-style-type: none"> ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question 	<ul style="list-style-type: none"> ✓ Familiarized with effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination diagnosis, treatment, recommend

	diseases	diseases		control and prevention of diseases
12	✓ Practice effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination, diagnosis, treatment, recommend control and prevention of diseases	✓ Conduct effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination diagnosis, treatment, recommend control and prevention of diseases	<ul style="list-style-type: none"> ✓ Recording of the case ✓ Observation of clinical cases ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question 	✓ Familiarized with effective client communications skills & record a thorough medical history & Perform a comprehensive physical examination diagnosis, treatment, recommend control and prevention of diseases
13	Diagnosis of cases encountered during Week 11 &12 (Assessment 4)		<ul style="list-style-type: none"> • Case presentation in group • Answer questions 	• Ability to appropriately diagnose the case
14	Final exam	✓ History taking and Clinical diagnosis of cases, diagnosis & treatment	✓ Individual oral examination	✓ Ability to appropriately diagnose the case and provide treatment
15	Final exam	✓ History taking and Clinical diagnosis of cases , diagnosis& treatment	✓ Individual oral examination	✓ Ability to appropriately diagnose the case and provide treatment
16	Final exam	✓ History taking and Clinical diagnosis of cases Diagnosis& treatment	✓ Individual oral examination	✓ Ability to appropriately diagnose the case and provide treatment

4.2.assessment strategies and techniques and courses policy

Assessment

- Clinic attendance_____10%
- Case presentation in group_____40%
- Individual oral examination_____50%
- Total100%

Courses policy

Student has to

- Attend 85% of the clinic
- Take all continuous assessment and mid exam
- Take final exam
- Respect all rules and regulation of the university

References

2. Radostits, O.M., D.C. Blood and C.C. Gay. 1994. Veterinary Medicine. 8th Ed. Bailliere Tindall, London.
3. Large Animal Internal Medicine, (Diseases of Horses, Cattle, Sheep, and Goats). 2nd Ed. The C.V. Mosby Co. Philadelphia, USA.
4. Hungerford. T. G. 1991. Hungerford’s Disease of Livestock. 9th Ed, McGraw-Hill Book Company. Sydney.
5. Howard, J.L. 1999. Current Veterinary Therapy, Food Animal Practice, W. B. Finders Publishers, USA.
6. Scott, D.W., W.H. Miller Jr. and C. Griffin. 1995. Muller and Kirk’s Small Animal Dermatology. 5th Ed. W.B. Saunders Co., Philadelphia
7. Robinson, N.E. 1997. Current Therapy in Equine Medicine. W.B. Saunders Co., Philadelphia
8. Aiello.S.E.1998. The Merck Veterinary Manual. 8th ed. Merck and CO., INC., Whitehouse Station, N.J., U.S.A

Approval section

	Name	Signature
Chair holder		
Department head		

Animal health Economics



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary Epidemiology and animal health Economics			
Module No.	08			
Course Title	Animal health Economics			
Course code	Vtsc-3081			
Credit Hrs/ECTS	Cr Hrs=2	Lecture Hrs=2	Laboratory=0	Home study=4 Cp/ECTS=3
Semester	I			
Year	III			
Pre-requisites	No			
Target group	Bachelor of Veterinary Science			
Status	Compulsory			
Instructor name and address				

2. Course Description

The course of animal health economics deals with the definition, importance and principles of economics in field of veterinary science.

Lectures:

The course of animal health economics deals with the definition and importance of economics; factors of production; supply and demand; elasticity; production analysis; cost and revenue analysis; application of economics in disease control; estimation of costs of disease and the benefits of their control; economics and decision-making in disease control.

Practical :Case –on disease control program (economic analysis, cost effectiveness)

3. Objectives of the Courses

At the end of the course student should able to:

- ✓ Describe the basic concepts of animal health economics
- ✓ Determine the costs and benefits associated with disease control and eradication.
- ✓ Understand the feasibility and economics of disease eradication programs in stable and changing populations.

4. Syllabus Components

4.1. Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
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<p>1, 2</p>	<p>Chapter 1: Introduction to principles of economics</p> <p>1.1. Definition, Branches and Role of economics</p> <p>1.2 Concept of limited resources and unlimited wants</p> <p>1.3 Important economic concepts</p> <p>1.4 Factors of production</p>	<p>✓ Provide lecture notes,</p> <p>✓ Brainstorming</p> <p>✓ Group discussion</p> <p>✓ Provide assignment</p>	<p>✓ Attend classes regularly</p> <p>✓ Listen the lecture and take notes from the lesson</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Take part in discussions</p>	<p>✓ familiar with the principles of economics</p> <p>✓ Describe the basic concepts of animal health economics</p>
<p>3,4</p>	<p>Chapter 2: Market behavior</p> <p>2.1. Supply and demand and market equilibrium</p> <p>2.2 Demand, supply, cross-price, and income elasticities.</p> <p>2.3 Consumer surplus and producer surplus</p>	<p>✓ Provide lecture notes,</p> <p>✓ Brainstorming</p> <p>✓ Group discussion</p> <p>✓ Reading and written assignment</p>	<p>✓ Attend classes regularly</p> <p>✓ Listen the lecture and take notes from the lesson</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Take part in discussions</p> <p>✓ Take part on reading assignment</p>	<p>✓ Describe Supply and demand and market equilibrium</p> <p>✓ Understand Demand, supply, cross-price, and income elasticities.</p>

<p>5,6</p>	<p>Chapter 3: Production analysis/economics</p> <p>3.1 Relationship between inputs and outputs</p> <p>3.2 In put combination (factor – factor relationship)</p> <p>Least cost combinations</p> <p>3.3 output combinations (product- product relationship)</p>	<p>✓ Providing short note</p> <p>✓ Brainstorming</p> <p>✓ Group discussion</p> <p>✓ Reading and written assignment</p>	<p>✓ Attend classes regularly</p> <p>✓ Listen the lecture and take notes from the lesson</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Take part in discussions</p> <p>Take part on reading assignment</p>	<p>-Understand Relationship between inputs and out puts</p> <p>✓ Describe Input and output combinations</p>
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7,8	<p>3. Chapter4:Economic impact of livestock diseases</p> <p>4. 4.1 Mechanism of disease effect on production</p> <p>5. 4.2 Direct and indirect cost of livestock disease</p> <p>6. 4.3 Tangible and intangible costs of livestock diseases</p>	<ul style="list-style-type: none"> ✓ Lecture on Economic impact of livestock diseases ✓ Brainstorming ✓ Providing short note 	<ul style="list-style-type: none"> ✓ Attend classes regularly ✓ Listen the lecture and take notes from the lesson ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take part in discussions ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Familiar with the Mechanism of disease effect on production ✓ Describe the direct and indirect cost of livestock disease
9	<p>Chapter5: Estimating disease losses/ costs</p> <p>5.1 Estimating direct costs</p> <p>5.1.1 Cost of mortality</p> <p>5.1.2 Cost of morbidity</p> <p>5.2 Estimating indirect loss</p>	<ul style="list-style-type: none"> ✓ Provide lecture notes, ✓ Group discussion ✓ Provide class work ✓ Assignment 	<ul style="list-style-type: none"> ✓ Attend classes regularly ✓ Listen the lecture and take notes from the lesson ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take part in discussions ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Familiar how to estimate direct and indirect costs of animal disease

<p>10</p>	<p>Chapter 6: The cost of animal disease control 6.1 The component of disease control costs 6.2 The importance of fixed and variable costs in planning disease control policy</p>	<ul style="list-style-type: none"> ✓ Lecture on the cost of animal disease control ✓ Provide short note on cost of animal disease control ✓ Group discussion ✓ Provide assignments 	<ul style="list-style-type: none"> ✓ Attend classes regularly ✓ Listen the lecture and take notes from the lesson ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take part in discussions ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Identify the cost of animal disease control ✓
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11,12,13,14	Chapter 7: Economic analysis tools for animal disease control 7.1 Farm level analysis 7.1.1 Gross margin analysis 7.1.2 Partial farm budgeting 7.1.3 Decision tree analysis	✓ Provide lecture notes, ✓ Group discussion ✓ Provide class work ✓ Provide Assignment	✓ Attend classes regularly ✓ Listen the lecture and take notes from the lesson ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take part in discussions ✓ Take part on reading assignment	✓ Understand Farm level analysis for animal disease control
15	Chapter 8.Economics analysis for zoonosis disease control 8.1 cost effectiveness analysis	✓ Provide lecture notes, ✓ Group discussion ✓ Provide class work ✓ Assignment	✓ Attend classes regularly ✓ Listen the lecture and take notes from the lesson ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take part in discussions ✓ Take part on reading assignment	✓ Exercise cost effectiveness analysis
16	Final exam			
4.2.assessment strategies and techniques and courses policy				
Assessment ✓ Quiz7% ✓ Test.....8% ✓ Assignment.....10% ✓ Mid exam.....25% ✓ Final exam.....50% ✓ Total100%				
Courses policy Student has to ✓ Attend 85% of the class ✓ take all continuous assessment and mid exam				

- ✓ Take final exam
- ✓ Respect all rules and regulation of the university

References

1. Amacher, R.C and Ulbrich, H.H (1986): *Principles of microeconomics*. Southwestern publishing co. USA, 3ed
2. Drummond H. E. (2004): *Agricultural economics*. 2nd ed. Pearson Education Inc, UK
3. Dijkhuizen , A.A. and Morris, R.S. 1997. *Animal health economics: principles and applications*. Post graduate foundation in veterinary science, university of Sydney, Sydney, Australia.
4. Edgar K. Browning and Mark A. Zupan (2011): *Microeconomic theory and application, 11th ed.*
5. Ellis, F. (1994): *Agricultural Policies in Developing Countries* Athenaeum Press, Great Britain.
6. Ghatak, S. and K. Ingeresent (1984): *Agriculture and Economic Development*, Wheetsha Books Ltd.
7. Johl, S. and Kapur, T. (2003): *Fundamentals of Farm Business Management*. Press Kalyni, India.
8. Key, R. D., Edwards, M.W.,Duffy, P.A. 2012. *Farm management*. Seventh edition. McGraw Hill inc. New York, USA
9. Lemma, B. (2003): *Basic Principles of Economics*. Press Mega, Ethiopia.
10. Putt, S. N. H, Shaw, A. P.NI, Woods, A. J., Tyler, L., and James, A.D. (1987). *Veterinary epidemiology and economics in Africa. A manual for use in the design and appraisal of livestock health policy*. ILCA manual No.3.
11. Rushton, J (2009):*The Economics of Animal Health and Production*. CAB International, UK.
12. Thrusfield, M (2005). *Veterinary Epidemiology*, 3rd ed. Blackwell Science ltd. Oxford.

Approval section

	Name	Signature
Chair holder		
Department head		

Veterinary Epidemiology & Preventive Medicine



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary Epidemiology and animal health Economics				
Module No.	08				
Course Title	Veterinary Epidemiology & Preventive Medicine				
Course code	Vtsc-4082				
Credit Hrs/ECTS	Cr Hrs=3	Lecture Hrs=3	Laboratory=0	Home study=7	Cp/ECTS=5
Semester	I				
Year	IV				
Pre-requisites	No				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

The courses of veterinary epidemiology and preventive medicine deals with occurrence .distribution and frequency of diseases in a population

Lectures: The course deals with the identification and quantification of the effect of multi-factorial disease determinants such as the host, environment and the agent; source, modes of transmission, and maintenance of infection; measurement of morbidity and mortality; disease ecology; observational studies; sampling strategies; interpretation of laboratory test results; animal health information system; risk analysis; anti-epizootic measures and economics of disease control. **Practical** Collecting secondary data from the record from different vet. clinics on diseases and making analysis: Morbidity, mortality rates, Visit to clinic to identify different types of national and international disease reporting formats and doing exercise using the formats, Diseases surveillance exercise, General diseases reporting system Importing, entering and editing data using SPSS and EPI-Info statistical software packages, Examining data and graphical representation, Multiple response analysis, questionnaire and coding, Hypothesis testing, significance and test selection, qualitative and quantitative data analysis using EPI- Info and SPSS

3. Objectives of the Courses

At the end of the course student should able to:

- ✓ To provide a comprehensive introduction to the role of epidemiology in veterinary medicine.
- ✓ Seek and identify the causes and effects of disease and investigate the ways in which infection is transmitted and maintained.
- ✓ To explore the methodology and interpretation of surveys, observational studies and clinical trials.
- ✓ Understand the concepts of economic analysis in disease control measures.
- ✓ Understand Concepts of risk analysis with the aims of protecting consumers' health or, exclusion of exotic disease agents.

4.Syllabus Components				
4.1.Course Contents, Methods, Strategies, and Learning Outcome				
	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	Chapter 1:General Introduction 1.1. Generalities 1.2. Uses Epidemiology 1.1. 1.3. Types of Investigations 1.2. 1.4. Epidemiology as a Diagnostic Tool 1.5. Interdisciplinary Relations	Introduce vet. Epidemiology and preventive medicine Brainstorming Lecturing	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓	✓ Develops positive attitude towards the courses ✓ Describe scopes, uses, types of epidemiology
	Chapter 2: Determinants of Disease 3.5. Introduction 3.6. Classifications 3.7. Epidemiologic Triad 3.8. Host as a determinant of diseases 3.9. Environmental factors 3.10. Agents as Determinants of Disease 3.11. Modes of Transmission 3.12. Maintenance strategies of Infectious	✓ Introduce determinants of diseases ✓ Brainstorming ✓ Lecture on types of determinants, ✓ Providing short note on epidemiological triad	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Describe different types of diseases determinant in a population ✓ Understand different ways of diseases transmission and maintenance strategies

	<p>1. Chapter 3:Diseases events in a population</p> <p>11.1. Infectious Process</p> <p>11.2. Stages of Infectious Process</p> <p>11.3. Forms of Infectious Process</p> <p>3.2. Epizootic Process</p> <p>3.3. General Considerations</p> <p>3.4. Sporadic Occurrence</p> <p>3.5. Endemic Occurrence</p> <p>3.6. Epidemic Occurrence</p> <p>3.7. Epidemic Curves</p>	<p>✓ Introduce diseases event in a population</p> <p>✓ Brainstorming</p> <p>✓ Lecture on infectious process</p> <p>✓ Providing short note on epizootic process</p> <p>✓ Lecture on nature of diseases occurrence</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion</p> <p>✓ Ask and answering</p>	<p>✓ Understand diseases event in a population</p> <p>✓ Describe nature of diseases occurrence in a population</p>
	<p>Chapter 4:Nature of Animal Population</p> <p>16.1. Categorization</p> <p>16.2. Number and density of Animal Population</p> <p>16.3. Geographic Location</p> <p>16.4. Movement</p> <p>16.5. Organization</p> <p>16.6. Turnover</p> <p>16.7. Population Resistance</p> <p>16.8. Management/Husbandry Practices</p>	<p>✓ Lecture on nature of animal population</p> <p>✓ Brainstorming</p> <p>✓ Providing short note</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion</p> <p>✓ Take reading assignment</p> <p>✓ Peer idea sharing</p>	<p>✓ Understand the concepts of nature of animal population</p>

Chapter 5: Measurement of diseases frequency 5.1. proportion/prevalence 5.2. incidence 5.3. morbidity rate 5.4. mortality rate 5.5. case fatality rate 5.6. case report 6.7. case serious	<ul style="list-style-type: none"> ✓ Introduce the use of diseases frequency measurement ✓ Quantification of diseases in a population ✓ Brainstorming ✓ Provide short note ✓ Discussion ✓ Class work 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Able to quantify diseases frequency
Chapter 6: Epidemiological data 6.1. Generality 6.2. classification 6.3. presentation	<ul style="list-style-type: none"> ✓ Define data ✓ Lecture on types of epidemiological data ✓ Brainstorming ✓ Provide short note on data presentation ✓ Discussion 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Identify types of epidemiological data ✓ Describe data presentation methods
Chapter 7: Epidemiological study design 7.1. classification	<ul style="list-style-type: none"> ✓ Introduce epidemiological study design ✓ Lecture on types of study design ✓ Pear idea sharing 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Describe different types of study design
Chapter 8: Sampling strategies 8.1. Introduction 8.2. Non-Probability Sampling Method 8.3. Probability/Random Sampling Method 8.4.1. 8.4. Sample Size	<ul style="list-style-type: none"> ✓ Define terminology ✓ Lecture on types of sampling ✓ Provide short note ✓ Class discussion 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Describe types of sampling techniques ✓ Exercise sample size calculation

<p>Chapter 9. Interpretation of Laboratory Results</p> <p>9.1. Pathognomonic Tests</p> <p>9.2. Surrogate Tests</p> <p>9.3. Test Sensitivity</p> <p>9.4. Test Specificity</p> <p>9.5. Predictive Values of a Test</p>	<p>✓ Introduce interpretation of laboratory results</p> <p>✓ Brainstorming</p> <p>✓ Lecture on different types of tests</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion and classwork</p>	<p>✓ Describe types of tests</p> <p>✓ Calculate values of different types of tests</p>
<p>Chapter 10: Anti-Epizootic Measures</p> <p>13.1. Prevention, Control</p> <p>13.2. Eradication</p> <p>13.3. Specific Activities for Directed Action</p> <p>13.3.1. Slaughter</p> <p>13.3.2. Quarantine</p> <p>13.3.3. Reduction of Contact</p> <p>13.3.4. Mass Treatment</p> <p>13.3.5. Modification of Host Resistance</p> <p>13.3.6. Environment/Management control</p> <p>10.4.7. Vector Control</p> <p>10.5. Important Factors in Control and Eradication Programs</p>	<p>✓ Lecture on different types of anti-epizootic measure</p> <p>✓ Class discussion</p> <p>✓ Brainstorming</p>	<p>✓ Listen lecture and take notes from the lecture</p> <p>✓ Forward all doubts relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion and classwork</p>	<p>✓ Describe all types of anti-epizootic measurement</p>

	<p>Chapter 11. Animal Health Information System</p> <p>11.1. Surveillance</p> <p>11.2. Monitoring</p> <p>11.3. Questionnaire administration</p>	<p>✓ Lecture on different types of animal health information system</p> <p>✓ Class discussion</p> <p>✓ Brainstorming</p>	<p>✓ Listen lecture and take notes from the lecture</p> <p>✓ Forward all doubts relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion and classwork</p>	<p>✓ Describe different types of information gathering methods</p>
	<p>Chapter 12. Introduction and application of risk analysis</p> <p>12.1. Objectives</p> <p>12.2. Components of risk analysis</p> <p>12.2.1. Risk assessment</p> <p>13.2.1.1. Risk determination</p> <p>13.2.1.2. Risk evaluation</p> <p>13.2.1.3. Health risk assessment</p> <p>12.2.2. Risk management</p> <p>12.2.3. Risk communication</p>	<p>✓ Lecture on risk in veterinary</p> <p>✓ Class discussion</p> <p>✓ Brainstorming</p> <p>✓ Provide short note on components of risk analysis</p>	<p>✓ Listen lecture and take notes from the lecture</p> <p>✓ Forward all doubts relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion and classwork</p>	<p>✓ Understand the concepts of risk in veterinary</p>

Final exam

4.2.assessment strategies and techniques and courses policy

Assessment

- Quiz7%
- Test.....8%
- Assignment.....10%
- Mid exam.....25%
- Final exam.....50%
- Total100%

Courses policy

Student has to

- Attend 85% of the class
- take all continuous assessment and mid exam
- Take final exam
- Respect all rules and regulation of the university

References

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- ✓ Byrd, D.M. and Cothorn, R. (2000). Introduction to risk analysis. Government Institutes, Rockville, Maryland.
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- ✓ Greenberg R.S. (1993). Medical Epidemiology. 1st ed.
- ✓ Leech, F.B. and sellers K.C. (1979). Statistical Epidemiology in Veterinary Sciences. Grittin and Company Ltd.
- ✓ Martin, S.W, Meek, A.H, and Willeberg P. (1987). Veterinary Epidemiology. Principles and Methods. Iowa state University Press. Ames.
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- ✓ Rothman, K.J. and Greenland, S. (1998). Modern Epidemiology. 2nd ed. Lippincott-Raven Publishers, PA.
- ✓ Thrusfield, M. (1995). Veterinary Epidemiology. 2nd ed. Butterworths London.

Approval section

	Name	Signature
Chair holder		
Department head		

Veterinary Surgery and Diagnostic Imaging



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary Surgery and Diagnostic Imaging				
Module No.	09				
Course Title	Veterinary Surgery and Diagnostic Imaging				
Course code	Vtsc-3091				
Credit Hrs/ECTS	Cr Hrs=3	Lecture Hrs=2	Practical =2	Home study=6	Cp/ECTS=5
Semester	II				
Year	III				
Pre-requisites	Veterinary anatomy				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

The course deals with the Introduction, history, classification and development of veterinary surgery. General surgical principles, pre-operative and post-operative considerations. Sutures and suture patterns; preparation of the patient and surgical equipment; minor surgical interventions (wound dressing, abscess, tumors, cysts, hematoma, hernia etc.); Hemorrhage and hemostasis, shock; post-operative complications and their management; fracture and dislocation; fluid and electrolyte therapy. Chemical restraint of animals (anesthesia); patient evaluation, selection of pre-medication, induction and maintenance agents, anesthetic equipment, monitoring depth of anesthesia and physiologic function.

Mode of delivery: Lecture, practical demonstrations, case, field works, seminar, assignments, professional documentaries

3. Objectives of the Courses

At the end of the course student should able to:

- ✓ To provide a comprehensive introduction to the importance of surgery in veterinary medicine.
- ✓ Understand the principles of applied anesthesiology and possess the essential information on anesthetic agents and routes of administration in the various animal species.
- ✓ Be familiar with surgical instruments, preparation of surgical instruments and surgical sites, sutures, anesthesia application, wound management and post-operative care

✓ Develop basic skills in minor surgical interventions.

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1	Chapter 1:General Introduction 1.1. Generalities 1.2. Types of surgery 1.3. Importance of vet. surgery	Introduce vet. Surgery	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture	✓ Develops positive attitude towards vet. Surgery and diagnostic Imaging ✓ Describe scopes, uses, types of Surgery
	Chapter 2: Surgical instruments	✓ Introduce Surgical instruments and their uses ✓ Lecture on Surgical instruments ✓ Providing short note on Surgical instruments and their uses	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Understand different Surgical instruments and their uses

2	<p>2. Chapter 3: Suture materials and suture needles</p> <p>3. 3.1. Nature of suture material and suture needles</p> <p>4. 3.2. Types of suture materials and needles</p> <p>5.</p>	<ul style="list-style-type: none"> ✓ Introduce different suture materials and needles ✓ Brainstorming ✓ Lecture on suture material and suture needles ✓ Providing short note on suture material and suture needles 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion ✓ Ask and answering 	<ul style="list-style-type: none"> ✓ Understand different suture materials and needles ✓ Describe natures of different suture materials and needles
3	<p>7. Chapter 4: Suture techniques</p> <p>4.1. Principles of suture</p> <p>4.2. Classification of suture Techniques</p>	<ul style="list-style-type: none"> ✓ Lecture on the principles Suture techniques ✓ Brainstorming ✓ Providing short note 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment ✓ Pear idea sharing 	<ul style="list-style-type: none"> ✓ Understand the Principles of suturing and Classification of suturing Techniques

4	Chapter 5: Principle of surgical asepsis 5.1. Introduction 5.2. Uses of surgical asepsis	<ul style="list-style-type: none"> ✓ Introduce the use of surgical asepsis ✓ Brainstorming ✓ Provide short note ✓ Discussion ✓ Class work 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Able to understand the Principle of surgical asepsis
	Chapter 6: Shock and fluid therapy	<ul style="list-style-type: none"> ✓ Introduce Shock and fluid therapy ✓ Lecture on Shock and fluid therapy ✓ Pear idea sharing 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Understand Shock and fluid therapy
5	Chapter 7: Veterinary Anesthesia 7.1. Introduction 7.2. Types of anesthesia 7.3. Mode of administration of anesthesia 7.4. Local anesthesia 7.5. General anesthesia	<ul style="list-style-type: none"> ✓ Define Veterinary Anesthesia ✓ Lecture on different anesthetic techniques ✓ Brainstorming ✓ Provide short note ✓ Discussion 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Identify types of anesthesia ✓ Understand different types of anesthetics and their mode of administration and action
6	Chapter 8: Wound, Hematoma and abscess management	<ul style="list-style-type: none"> ✓ Lecture on types Wound, Hematoma and abscess ✓ Provide short note 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture 	<ul style="list-style-type: none"> ✓ Describe types of types Wound, Hematoma and abscess ✓ Exercise Wound,

		<ul style="list-style-type: none"> ✓ Class discussion 	<ul style="list-style-type: none"> ✓ Take reading assignment 	Hematoma and abscess management
7	Chapter 9. Hemostasis, Post-operative complications and their management	<ul style="list-style-type: none"> ✓ Brainstorming ✓ Lecture on Hemostasis, Post-operative complications and their management 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork 	<ul style="list-style-type: none"> ✓ Understand values of Hemostasis, Post-operative complications and their management in surgery
8	Chapter 10: Surgery of head and neck . 10.1. Dehorning in cattle . 10.2. Irregular molars, shear mouth, sharp teeth . 10.3. Operation for aural haematoma in dogs . 10.4. Operation for entropion and ectropion 10.5. Extirpation of eyeball in cattle, horse and dogs, Yolk gall, Yolk abscess, Yolk tumours.	<ul style="list-style-type: none"> ✓ Lecture on different surgical procedures of head and neck ✓ Class discussion ✓ Brainstorming 	<ul style="list-style-type: none"> ✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork 	<ul style="list-style-type: none"> ✓ Familiarized with different surgical procedures on head and neck region

9	<p>Chapter 11. Surgery of thorax 11.1. Tracheotomy in cattle and dog 11.2. Diaphragmatic hernia in cattle and dog 11.3. Cervical esophagotomy in cattle horse and dog.</p>	<p>✓ Lecture on different surgical intervention on thorax region</p> <p>✓ Class discussion</p> <p>✓ Brainstorming</p>	<p>✓ Listen lecture and take notes from the lecture</p> <p>✓ Forward all doubts relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion and classwork</p>	<p>✓ Know different surgical intervention done on thorax region</p>
10,11	<p>Chapter 12. Surgery of abdomen 12.1. Laparotomy (Celiotomy) in dog and cattle. 12.2. Rumenotomy in ruminants. 12.3. Gastrotomy in animals. 12.4. Enterotomy and End to end anastomosis of intestine. 12.5. Amputation of rectum in cow. 12.6. Surgical management of atresia ani and atresia ani et recti. 12.7. Extirpation of anal sac in dog. 12.8. Repair of ventral hernia in cow and horse. 12.9. Repair of perineal hernia in dog.</p>	<p>✓ Lecture on different surgical procedures done on abdomen</p> <p>✓ Class discussion</p> <p>✓ Brainstorming</p> <p>✓ Provide short note</p>	<p>✓ Listen lecture and take notes from the lecture</p> <p>✓ Forward all doubts relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion and classwork</p>	<p>✓ Familiarized with different surgical procedures done on abdomen and anal region</p>

<p>12,13</p>	<p>Chapter 13. Surgery on urogenital organs of male and female 13.1. Urethrotomy in animals. 13.2. Castration in bull, horse and dogs 13.3. Repair of inguinal/ scrotal hernia in bull and horse. 13.4. Ovariohysterectomy in bitches 13.5. caesarean section in dog and cow 13.6. episiotomy in dog and cow 13.7. Caslick's vulvoplasty in mares 13.8. Repair of vaginal and uterine prolapse in cow</p>	<p>✓ Lecture on different surgical procedures done on urogenital organs of male and female ✓ Class discussion ✓ Brainstorming ✓ Provide short note</p>	<p>✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork</p>	<p>✓ Familiarized with different surgical procedures performed on urogenital organs of male and female</p>
<p>14</p>	<p>Chapter 14. Orthopedic surgery 18.1. Bone fracture 18.2. Types of bone fracture 18.3. Principles and techniques of bone fracture Management</p>	<p>✓ Lecture on bone fracture and management ✓ Class discussion ✓ Brainstorming ✓ Provide short note</p>	<p>✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork</p>	<p>✓ Familiarized with different bone fracture management</p>

15	Chapter 15. Introduction to diagnostic imaging 15.1. Introduction 15.2. Radiology 15.3. Advanced diagnostic tools	✓ Lecture on diagnostic imaging ✓ Class discussion ✓ Brainstorming ✓ Provide short note	✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork	✓ Familiarized with different diagnostic imaging tools
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16	Final exam			
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4.2.assessment strategies and techniques and courses policy

Assessment	
➤	Quiz7%
➤	Test.....8%
➤	Assignment.....10%
➤	Mid exam.....25%
➤	Final exam.....50%
➤	Total100%

Courses policy	
Student has to	
Attend 85% of the class	
• take all continuous assessment and mid exam	
• Take final exam	
• Respect all rules and regulation of the university	

5. References	
1.	Bojrab, M.J. 1998. Current Techniques in Small Animal Surgery. 4th Ed. Lea &Febiger, Philadelphia, USA.
2.	Fossum, T.W. 2003. Small Animal Surgery. Mosby Year Book Inc., Philadelphia,USA.
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Propose practical activity

Week	Practical work	Tasks	Due date for submission of Report
1	Introduction to the layout of operation theatre	Report Writing	3
2	Common equipments and surgical instruments	Report Writing	4
3	Restraint, positioning, bandaging, catheterizations etc	Report Writing	5
4	Operation theatre routines, preparation of surgical pack, sterilization	Report Writing	6
5	Familiarization with various suture materials and suture patterns	Report Writing	7
6	demonstration of surgical procedures	Report Writing	3
7	Demonstration of anesthetic equipments	Report Writing	4
8	8. Anaesthesia: <ul style="list-style-type: none"> • Pre-anesthetic examination of animals • Induction and maintenance of anesthesia and monitoring of patient • Cardiopulmonary resuscitation of patient • Nerve blocks • Regional • Epidural anesthesia in farm animals 	Report Writing	5

9	Introduction to the layout of operation theatre, common equipments, surgical instruments.	Report Writing	6
10	Restraint, positioning, bandaging, catheterizations etc.	Report Writing	7
11	Operation theatre routines	Report Writing	3
12	Preparation of surgical pack	Report Writing	4
13	Sterilization.	Report Writing	5
14	Familiarization with various suture materials, sutures, tying surgical knots, double hand knots, tension sutures, bowel and uterine sutures etc.	Report Writing	6
15	Demonstration of surgical operation-control of hemorrhage, suturing etc.	Report Writing	7
16	Initiation to live surgery. Surgical operations.	Report Writing	3

Approval section

	Name	Signature
Chair holder		
Department head		

Animal Health Extension and Pastoralism



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Animal Health Extension and Business Management				
Module No.	10				
Course Title	Animal health extension and pastoralism				
Course code	Aheb3101				
Credit Hrs/ECTS	Cr Hrs=2	Lecture Hrs=2	Laboratory=0	Home study=4	Cp/ECTS=3
Semester	II				
Year	III				
Pre-requisites	No				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

The challenge for trainers approaching rural development is to not simply develop a training package and delivery methodology for the clients, but the course deals with description of the Ethiopian livestock sector; livestock production system; agricultural knowledge systems; principles of extension; extension approach and principles of pastoralism, pastoral economy and policy options for pastoralism.

- ✓ **Lectures:** The course deals with the different extension teaching approaches, the objectives and principles of animal health extension, the RRA research methods, principles of pastoralism or agro-pastoralism and pastoral production systems in Ethiopia, the challenges and opportunities associated with the development of pastoralist community.
- ✓ **Practical:** Applying different types of Animal Health Extension teaching methods for farmers presented to the nearby vet clinics and field visit in pastoralist areas of Ethiopia.

3. Objectives of the Courses

At the end of this course, students should be able to:

- ✓ Describe the different extension teaching approaches,
- ✓ Describe the objectives and principles of animal health extension,
- ✓ Describe the RRA research methods,
- ✓ Understand principles of pastoralism or agro-pastoralism and pastoral production systems in Ethiopia,
- ✓ Know different extension approaches fit to the pastoral conditions,
- ✓ Identify the challenges and opportunities associated with the development of pastoralist community.

4.Syllabus Components				
4.1.Course Contents, Methods, Strategies, and Learning Outcome				
Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1	Part I: Animal Health extension 1. Description of the Ethiopian livestock sector 2. Cultural knowledge information systems	✓ Introduce the livestock sector of Ethiopia ✓ Brainstorming ✓ Lecturing on Cultural knowledge information systems ✓ Discussion	✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions	✓ Develops positive attitude towards the courses ✓ Understanding about Ethiopian livestock sector ✓ Describe the Cultural knowledge information systems
2	3. Objectives and principles of extension education 4. Extension teaching methods and alternative approaches	✓ Introduce the objectives and Principles of Animal health Extension Education ✓ Brainstorming ✓ Lecture on Extension teaching methods and alternative approaches, ✓ Discussion ✓ Summarize the Session	✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions	✓ Describe objectives and Principles of Animal health Extension Education ✓ Understand different ways of Extension teaching and alternative approaches

3	<p>5. Rapid Rural Appraisal (RRA) techniques</p> <p>6. The concept of the contact family</p>	<ul style="list-style-type: none"> ✓ Introduce Rapid Rural Appraisal (RRA) techniques ✓ Brainstorming ✓ Lecture on the concept of the contact family ✓ Discussion ✓ Summarize the Session 	<ul style="list-style-type: none"> ✓ Students must react voluntarily to questions asked & take lecture note 	<ul style="list-style-type: none"> ✓ Understand Rapid Rural Appraisal (RRA) techniques ✓ Describe the concept of the contact family
4	<p>7. The classic “extension by example” approach:</p> <p>7.1. Demonstrations,</p> <p>7.2. Field days,</p> <p>7.3. Group meetings</p>	<ul style="list-style-type: none"> ✓ Lecture on the classic “extension by example” approach: ✓ Brainstorming ✓ Providing short note ✓ Discussion ✓ Summarize the Session 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Understand the classic “extension by example” approach
5	<p>Part II: Pastoralism</p> <p>1. Dynamics of pastoral systems in East Africa.</p>	<ul style="list-style-type: none"> ✓ Briefing about pastoral systems in East Africa. ✓ Brainstorming ✓ Provide short note ✓ Discussion 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Understand the dynamics of pastoral systems in East Africa.

6	2. Pastoralism as a “system” regulated by ecology and complex modes of social, political and economic organization	<ul style="list-style-type: none"> ✓ Introduction about regulation about pastoralism ✓ Discussion 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Describe how the pastoralism as a system is regulated
7 & 8	<p>3. Past policies with regard to pastoralism</p> <ul style="list-style-type: none"> ✓ Alienation of pastoral land for other uses 	<ul style="list-style-type: none"> ✓ Introduce past policies with regard to pastoralism ✓ Brainstorming ✓ Provide short note ✓ Discussion 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Describe past policies with regard to pastoralism and alienation of pastoral land for other uses
9&10	<p>4. Trial to modernize pastoral systems;</p> <ul style="list-style-type: none"> ➤ The effects of the interventions 	<ul style="list-style-type: none"> ✓ Lecturing on the trials to modernize pastoral systems ✓ Brainstorming ✓ Lecturing on the effects of the interventions ✓ Class discussion 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Describe the trials to modernize pastoral systems and their effects
11	5. Policy challenges and options for pastoralism	<ul style="list-style-type: none"> ✓ Introduce policy challenges for pastoralism ✓ Brainstorming ✓ Lecture on options for pastoralism ✓ Class discussion 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, 	<ul style="list-style-type: none"> ✓ Understand the policy challenges and options for pastoralism

12	6. Analysis of current reforms with respect to land and natural resource management	<ul style="list-style-type: none"> ✓ Lecture on analysis of current reforms with respect to land ✓ Brainstorming ✓ Lecture on analysis of current reforms with respect to natural resource management ✓ Class discussion 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Describe the analysis of current reforms with respect to land and natural resource management
13	7. Pastoralism within the context of national poverty reduction strategies	<ul style="list-style-type: none"> ✓ Lecture on pastoralism as national poverty reduction strategies ✓ Class discussion 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Describe the role of Pastoralism as part of national poverty reduction strategies
14	8. Pastoralism and decentralization	<ul style="list-style-type: none"> ✓ Lecture on pastoralism and decentralization ✓ Brainstorming ✓ Class discussion 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Understand the effect of decentralization on pastoralism

15	9. Pastoralism and increasing privatization and foreign investment	<input checked="" type="checkbox"/> Lecturing on the effect of increasing privatization and foreign investment on pastoralism and <input checked="" type="checkbox"/> Discussion	<input checked="" type="checkbox"/> Listen to a lecture and take notes on the lesson, <input checked="" type="checkbox"/> Forward all the confusion or doubts relation to the given lecture, <input checked="" type="checkbox"/> Take part in discussions	<input checked="" type="checkbox"/> Understand the effect of increasing privatization and foreign investment on pastoralism
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16 Final exam

4.2.assessment strategies and techniques and courses policy

Assessment

• Quiz	7%
• Test.....	8%
• Assignment.....	10%
• Mid exam.....	25%
• Final exam.....	50%
• Total	100%

Courses policy

Student has to

- Attend 85% of the class
- take all continuous assessment and mid exam
- Take final exam
- Respect all rules and regulation of the university

6. References

1. Ellis, J.E. and Swift, D.M. (1988). Stability of African pastoral ecosystems: alternative paradigms and implications for development. J. Range Manag. 41(6):450–459.
2. Price, K.G. and Verios, L. (1999), IDEAS – a diversification manual for the pastoral rangelands, AGWEST,ISSN1326-4168.

Approval section

	Name	Signature
Chair holder		
Department head		

Entrepreneurship and Business Development



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course information	
Module Name	Animal Health Extension and Business Management
Module No.	10
Course Title	Entrepreneurship and Business Development
Course code	Aheb4102
Credit Hrs/ECTS	Cr Hrs=3 Lecture Hrs=3 Laboratory=0 Home study=7 Cp/ECTS=3
Semester	I
Year	IV
Pre-requisites	No
Target group	Bachelor Veterinary Science
Status	Supportive
Instructor name and address	

2. Course Description

Designed to familiarize students with the essence of entrepreneurship; the role of the entrepreneur; the role of small-scale agro industries in economic development(Emphasis zing mainly on Ethiopian context); common problems in organizing agribusiness firms; types, functions and behavioral patterns of entrepreneurs; business plan preparation; financing small-scale agro-industries and the place of gender in entrepreneurship.

Course Objectives:Up on completion of this learning task, students will be able to:

- Differentiate between entrepreneur and entrepreneurship
- Identify the main characteristics of entrepreneur and entrepreneurship
- Identify the role of entrepreneur and entrepreneurship
- Identify the main traits to entrepreneurs
- Identify the types and functions of entrepreneurs
- Identify the main elements of a business plan and develop a business plan
- Understand the challenges and role of gender in entrepreneurship
- Understand how small scale agro-industries facilitate economic development process

Identify the common problems entrepreneurs face while organizing agribusiness

4.Syllabus Components				
4.1.Course Contents, Methods, Strategies, and Learning Outcome				
Week s	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1,2,3	1.1. Definition and philosophy of Entrepreneurship Vs Entrepreneurs 1.1.1. Historical origin of entrepreneurship 1.2.Type of Entrepreneurs 1.3. Role within the economy 1.4. Entrepreneurial Competence and Environment 1.4.1. Entrepreneurial Mindset 1.4.2. Demographic Factors 1.4.3. Entrepreneurial Environment 1.5. Entrepreneurship, creativity and innovation	<ul style="list-style-type: none"> ➤ lecture ➤ buzz group discussion ➤ quiz 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Develops positive attitude towards the courses ✓ Understanding Entrepreneurs hip
W 4-5	2. Business planning 2.1 Opportunity identification and evaluation 2.2 Business idea development 2.2.1 Business idea identification 2.2.2 Source of business idea 2.2.3 Methods of generating business idea 2.3 The concept of business planning 2.5 Main elements(components) of a business plan 2.6 Developing business plan 2.7 Business Enabling Environment	<ul style="list-style-type: none"> ➤ Lecture ➤ Group discussion ➤ Presentation ➤ Exercises and Assignments 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Describe business planning ✓ Develop business plan
W 6-7	3. Business Formation 3.1 The Concept of Business Development 3.2 Forms of Business (a short explanation) 3.3 Definition and Importance of SMEs 3.4 Setting up small scale business 3.5 Roles of SMEs 3.6 Business failure and success factors. 3.7 Problems of small scale business in Ethiopia	<ul style="list-style-type: none"> ➤ Lecture ➤ Group discussion ➤ Presentation Exercises and Assignments 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Describe business formation ✓ Develop concepts of small scale business
W8-9	4. Product or Services	➤ Lecture	✓ Listen to a	✓ Describe

	<p>Development</p> <p>4.1 The Concept of product or service</p> <p>4.2 Product or service development Process</p> <p>4.3 Legal and regulatory frameworks</p> <p>4.4 Intellectual Property Protection/Product or service protection</p> <ul style="list-style-type: none"> ➤ .Patent ➤ Trademarks ➤ Copyrighting 	<ul style="list-style-type: none"> ➤ Group discussion ➤ Presentation Exercises and Assignments 	<p>lecture and take notes on the lesson,</p> <ul style="list-style-type: none"> ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<p>product development</p>
W10-11	<p>5. MARKETING</p> <p>5.1 The Concept and philosophy of marketing</p> <p>5.2 Marketing Mix and Strategies</p> <p>5.3 Marketing Information System</p> <p>5.3.1 Marketing intelligence</p> <p>5.3.2 Marketing research</p> <p>5.4 Competitive analysis</p> <p>5.5 Selling and Customer Service</p>	<ul style="list-style-type: none"> ➤ Lecture ➤ Group discussion ➤ Presentation Exercises and Assignments 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, Take part in discussions 	<ul style="list-style-type: none"> ✓ Describe marketing ✓ Understand Marketing Information System
W12-13	<p>6. Financing the new venture</p> <p>6.1 Overview of business Financing</p> <p>6.2 Main types of Financial Resources</p> <p>6.2.1 Sources of financing</p> <p>6.2.2 Equity financing</p> <ul style="list-style-type: none"> ❖ Debt financing ❖ Trade credit ❖ Leasing financing <p>6.3 Traditional financing</p> <p>6.4 Crowd funding</p> <p>6.5 Micro finance in Ethiopia</p>	<ul style="list-style-type: none"> ➤ Lecture ➤ Group discussion ➤ Presentation Exercises and Assignments 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation to the given lecture, ✓ Take part in discussions 	<ul style="list-style-type: none"> ✓ Describe Financing the new venture
W14-15	<p>7 Small Business growth and Management</p> <p>5.1 Managing Business growth</p> <ul style="list-style-type: none"> • Function of management <p>5.2 New venture expansion strategies</p> <p>5.3 Small business in Ethiopia</p> <p>5.4 Business ethics and social</p>	<ul style="list-style-type: none"> ➤ Lecture, ➤ Group discussion ➤ Q & A sessions 	<ul style="list-style-type: none"> ✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts relation 	<ul style="list-style-type: none"> ✓ Describe Small Business growth and Management ✓ Understand Business

	responsibility		to the given lecture, ✓ Take part in discussions	ethics and social responsibility
W 16	Final exam			
4.2.assessment strategies and techniques and courses policy				
Assessment				
<ul style="list-style-type: none"> • Quiz7% • Test.....8% • Assignment.....10% • Mid exam.....25% • Final exam.....50% • Total100% 				
Courses policy				
Student has to				
<ul style="list-style-type: none"> ✓ Attend 85% of the class ✓ take all continuous assessment and mid exam ✓ Take final exam ✓ Respect all rules and regulation of the university 				
References				
<ol style="list-style-type: none"> 1. Hirsh RobertD. and D. and Peters MichaelP. “Entrepreneurship” Fifth Edition, Tata McGraw Hill Edition, 2002. 2. Justin G. Longenecker and Carlos W. Moore, Small Business Management 12th edition, College Division South Western Publishing Co. Dallas, 2003 3. Holt David H. “Entrepreneurship – New venture Creation “Eastern Economy Edition, 2000. 4. DonaldF.Kutatko and RichardM.Hodgetts, “Entrepreneurship: A Cotemporary Approach” Fourth Edition. 5. HailayGebretinsae, Entrepreneurship and Small Business Management, 2nd Edition. approach “. Fourth Edition, the Dryden Press, 1998. 				
Approval section				
	Name	Signature		
Chair holder				
Department head				

Veterinary Ethics and Animal Welfare



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary Ethics and Animal Welfare				
Module No.	11				
Course Title	Veterinary Ethics and Animal Welfare				
Course code	VtSc S3111				
Credit Hrs/ECTS	Cr Hrs=2	Lecture Hrs= 2	Laboratory=0	Home study=4	Cp/ECTS=3
Semester	II				
Year	III				
Pre-requisites	No				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

Veterinary ethics and jurisprudence deals with ethics of veterinary profession in relation to clients, profession, public and Ethiopian regulations concerning practice on various dimensions of veterinary profession. This course deals with ethical principles in veterinary medicine, animal welfare issues, the five fundamental animal freedoms, global concerns on animal biotechnology and issues of animal welfare and ethics and animal welfare in Ethiopian context.

3. Objectives of the Courses

At the end of the course student should able to:

- Describe the principles of ethics in veterinary medical profession
- Understand and put in practice the regulations stipulated in the country concerning the profession
Forward new regulations that are important but lacking that could support the proper practice of the profession in the country.
- Knowledgeable with Concepts in animal welfare; welfare assessment; and physiological indicators of welfare. Evaluate management of welfare in-group systems
- Access relevant information & resources related to Animal Welfare from local & international Animal Welfare Organizations

4.Syllabus Components				
4.1.Course Contents, Methods, Strategies, and Learning Outcomes				
Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1	Chapter 1. Veterinary Ethics 1.1. Introduction & definition of ethics, 1.2. Ethical veterinarians, 1.3. Veterinary Ethics in: Patient client, profession, Regulations concerning: Prescribing, Dispensing, Marketing, Merchandising of Ethical Veterinary Products	Introduce : The Concept of Ethics & Ethical Theories Describe: Ethical Practices in various aspects of Veterinary medicine	✓ Attend the lecture and take notes from the lecture ✓ Forward all the clarifications/doubts in relation to the given lecture	✓ Develop an overview & positive attitude towards the course ✓ Understand & Appreciate Ethical Practices that Veterinarians should follow
2	Chapter 2. Principles of Veterinary Ethics 2.1 Veterinarians Oath, 2.2. Duties to Clients in: Consultation, the public, Medical records, Fees & Remuneration, Advertising Euthanasia, Disciplinary action 2.3 General Discussion Relevant to Ethiopia	Introduce: The Principles that underlie the Practice of Veterinary medicine Describe: Veterinary Ethics in the Ethiopian Context	✓ Attend the lecture and take notes from the lecture ✓ Forward all the clarifications/doubts in relation to the given lecture	✓ Understand the Commitment required for Ethical Practice of Veterinary medicine ✓ Understand & Analyze the status of the Veterinary Ethics in Ethiopia
3.4	Chapter 3. Veterinary Jurisprudence 3.1. Introduction, definitions, 3.2. Animal rights and animal welfare, 3.3. Violations of animal rights and welfare (domestic, companion, working, lab, entertainment, and wild animals) and punishment (from international point of view), 3.4. Management of Experimental animals 3.5. Humane handling of slaughter	Introduce: The Concept of Veterinary Jurisprudence Describe: The Conflict Between Animal	✓ Attend the lecture and take notes from the lecture ✓ Forward all the clarifications/doubts in relation to the given	✓ Develop consciousness of the legal systems pertaining to the Ethical management of all animals including

	<p>animals, 3.6.Forensic Veterinary Medicine, Criminal code of the Federal Democratic Republic of Ethiopia, Ethiopian Veterinary Legislations</p>	<p>rights vs. Animal Welfare.</p> <p>Ethical handling & Management of all animals.</p> <p>Ethiopian Veterinary Legislations</p>	<p>lecture</p>	<p>livestock</p> <p>✓ Familiarize with the Ethiopian Veterinary Legislations including law enforcement for unethical practices</p>
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5,6	<p>Chapter 4: Animal welfare and Animal Bio-technology-Ethical Issues 4.1 Animal cloning 4.2. Embryo transfer 4.3. The use of somatotrophin hormone 4.4. Invitro fertilization (IVF) 4.5. Global concerns and Ethiopian position on animal welfare and biotechnology issues</p>	<p>Introduce: Animals Used in Research Regulations in Animal Research Animal Cloning & Transgenic Animals Use of recombinant Bovine Somatotropin in order to increase Milk Production IVF. Advantages & Constraints in the Application of Animal Biotechnology Describe: Agricultural Biotechnology Research in Ethiopia: Status, opportunities & challenges</p>	<p>✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion ✓ Ask and answering</p>	<p>✓ Understand & Appreciate the Potential of Animal Biotechnology in increasing Productivity & Yield . ✓ Also, be informed about the constraints, Ethical & Animal Welfare issues & regulations in applying Animal Biotechnology .</p>
7,8	<p>8. Chapter 5: Environmental Ethics in Livestock Production 5.1. Animal waste disposal strategies 5.2. Site selection for farm and abattoir establishment 5.3. Livestock production and environmental sanitation</p>	<p>Introduce: Livestock production & Environmental Sanitation. Describe: Agricultural Disposal Systems. BOD as an Indicator of Water Pollution. Eutrophication Untreated Waste as a Public Health Concern Indicator Microorganisms, Manure Handling & Disposal Systems Prevention & Control of Gases & Odors from Livestock wastes, Disposal of Dead Animals Livestock Laws</p>	<p>✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment ✓ Peer idea sharing</p>	<p>✓ Understand & Update the Ethical Issues arising from Livestock Production ✓ Be informed about the procedures, systems & laws that govern Animal Waste Treatment & Management</p>

<p>9,10</p>	<p>Chapter 6. Concepts in animal welfare. 6.1. Definitions; Animals as sentient beings. 6.2. Anthropomorphism in Animal Welfare 6.3. Animal Welfare & Animal Death 6.4. Terrestrial Animal Health Code 6.5. Three Areas of Concern in Animal Welfare 9.</p>	<p>✓ Introduce: Animal Sentience ✓ Describe:Suffering as a Basis for Animal Sentience ✓ Use of Anthropomorphism as Human Assessment of Animal Welfare ✓ Sentient Animals that are of Concern to Veterinarians ✓ Correlating Animal Welfare With Death ✓ Criteria for Assessing good Animal Welfare</p>	<p>✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment ✓ Pear idea sharing</p>	<p>Conceptualize: The necessity for Animal Welfare The Limitations of Anthropomorphism in Assessing Animal Welfare Criteria for Assessing Animal Welfare</p>
<p>11</p>	<p>Chapter 7. Animal Welfare Assessments 7.1. Five freedoms Approach 7.2 Introduction to Scientific Methodologies</p>	<p>Introduce: Five Freedoms as a Framework to Assess Animal Welfare Describe: Various Scientific methods such as Preference test for assessing Animal Welfare</p>	<p>✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment Pear idea sharing</p>	<p>Understand & Be Well informed about the Use of Various Scientific Methods in Assessing Animal Welfare</p>
<p>12</p>	<p>Chapter 8. Physiological indicators of welfare.</p>	<p>Introduce & Describe Parameters such as: Heart rate, Corticosteroids Immune Function Eggshell Quality & Thermographic Cameras as Physiological Indicators of Animal Welfare</p>	<p>✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment</p>	<p>✓ Understand & Appreciate various physiological, biological and technical tools that are Useful in Assessing Animal Welfare</p>

13	Chapter 9. Group Assessment of Animal Welfare	Introduce & Describe: Welfare Status of Individual Animal extrapolated to Group Welfare	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	✓ Understand How, in Practice, Measurements of Welfare in Individual Animals are often used to Assess welfare at the group level (i.e. Flock/Herd)
14	Chapter 10. Human - Animal Interaction. 10.1. Human - Animal Relationship. 10.2. Conflict in human attitudes to animals.	Introduce & Describe: Interactions that Involve: Perception(Visual, Tactile, Olfactory & Auditory), & Interactions that Involve Physical Contact With Animals Describe: Factors that Cause Conflict in Human Attitudes to Animals	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	✓ Understand various types of Interactions in Developing the Human-Animal Bond ✓ Understand the Various Factors that Cause Conflict in Ethical Treatment of Animals & How it can be Resolved
15	Chapter 11: Animal welfare organizations. 11.1. Aims and objectives; 11.2. Role within the community; 11.3. Selection & Training people working with animals; 11.4. Working relationship with the Veterinary profession; 11.5. International cooperation and assistance.	✓ Introduce: Various Animal Welfare Organizations Describe: Major Health Initiatives of Animal Welfare Organizations	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment	✓ Be Well Informed about Resources available from Various (local & international) Animal Welfare Organizations

16	Final exam	
4.2.assessment strategies and techniques and courses policy		
Assessment		
✓	Quiz	7%
✓	Test.....	8%
✓	Assignment.....	10%
✓	Mid exam.....	25%
✓	Final exam.....	50%
✓	Total	100%
Courses policy		
Student has to		
	Attend 85% of the class	
•	take all continuous assessment and mid exam	
•	Take final exam	
•	Respect all rules and regulations of the university	
7.	References	
	Veterinary Jurisprudence. Sixth Edition. S.N.Sharma, A.K.Gahlot, R.K.Tanwar. NBS Publisher and Distributor	
	Veterinary Jurisprudence and Post-mortem. Third Edition. Y.P.S.Dabas, O.P.Saxena, Ranum Dabas. International Book Distributing Co.	
	Kilgour R. and Dalton C. 1984 Livestock Behavior. A Practical Guide. Granada Publishing Limited.	
	Taylor R. E. and Field T. G. 2001 Scientific Farm Animal production. Seventh Edition. Prentice Hall.	
	Alcock J. 2005 Animal Behavior. An Evolutionary Approach 8 th Edition. Arizona State University	
	Fraser A. F. and Broom D. M. 1990 Farm Animal Behavior and Welfare. London Bailliere Tindall	
	Haupt K.A. 1991 Domestic Animal Behavior for Veterinarians and Animal Scientists. Ames IA, Iowa State University Press.	
	Mc Glone J. J. 1994 Animal Behavior (Ethology) Encyclopedia of Agricultural Science. San Diego Academic. Press. Inc.	
	Monahan P. and Wood-Gush D. 1990 Managing the Behavior of Animals. New York: Chapman & Hall	
Approval section		
	Name	Signature
Chair holder		
Department head		

Veterinary Gynecology and Reproductive Technology



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary Gynecology and Reproductive Technology				
Module No.	12				
Course Title	Veterinary Gynecology and Reproductive Technology				
Course code	Vtsc-3121				
Credit Hrs/ECTS	Cr Hrs=3	Lecture Hrs=2	Laboratory=1	Home study=7	Cp/ECTS=5
Semester	II				
Year	III				
Pre-requisites	No				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description; The course provides students an in-depth knowledge of structure and functions of reproductive organs in female animals and regulation of reproduction in female domestic animals. It also enables students to manage obstetrical problems, reproductive diseases and abnormalities and apply reproductive biotechnologies to enhance animal production.

Lectures: Functional anatomy of female reproductive system. Growth and puberty, estrous cycle, factors affecting estrous cycle in farm animals, ovulation and fertilization, physiology of gestation, parturition and lactation. Comparative aspects of reproduction in different species of domestic animals. Embryo-transfer and Artificial Insemination will also be considered.

Practical: Demonstration and palpation of female reproductive organs, induction of parturition, farm visits, case attendance in the clinic. Functional anatomy of male genital organs. Andrological investigations of breeding bulls; diagnosis of reproductive disorders in bulls; Preparation of artificial vagina (AV); collection of semen and evaluation; Insemination techniques, pregnancy diagnosis.

3.Objectives of the Courses

At the end of the course student should able to:

- ✓ Possess an in-depth knowledge of functions of reproductive organs and control of reproduction in female domestic animals.
- ✓ Be familiar with differences of reproduction in different species.
- ✓ Be able to comprehend the physiological state of female reproductive organs.
- ✓ Possess skill in pregnancy diagnosis and management of obstetrical problems;
- ✓ Know and be able to manage diseases and abnormalities related to the female reproductive system;
- ✓ Apply breeding soundness examination principles in bulls

4.Syllabous Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1	1. Anatomy of Female Genital System 1.1. Embryology development 1.2. Gross Morphology 1.3. Functional anatomy	2. Introduce Embryological development, Anatomy and Physiology of Female Genital System	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture	✓ Describe Embryological development, Anatomy and Physiology of Female Genital System
2	2. Season and Cycles 2.1. Puberty and sexual Maturity; factors Affecting Puberty 2.2. Breeding seasons 2.3. Classification of Animal Species- Mono, Di, poly, Seasonal Polyestrus	✓ Lecturing on puberty and Sexual maturity ✓ Brainstorming ✓ Lecture factors affecting the onset of puberty ✓ Group Discussion ✓ Introducing the breeding seasons and classification of seasonal breeder animals	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask& answer question ✓ Take part on reading assignment	✓ Understand the difference between Puberty and Sexual maturity ✓ Describe breeding season and classification of animals
3	3. Reproductive Hormones of Female Animals 3.1. Primary Hormones ➤ Hypothalamic; ➤ Hypopyseal; ➤ Gonnadal; ➤ Uterine; ➤ Placental (Source, Structure, Function) 3.2. Secondary Hormones: ➤ TSH (Thyroxin);	✓ Introduce reproductive hormones and their classification system ✓ Brainstorming ✓ Lecture on each types of hormones ✓ Discussion and summarizing the session	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Take reading assignment ✓ Group discussion ✓ Ask and	✓ Understand hormones of female reproductive system ✓ Describe types of reproductive hormones of female animals

	<ul style="list-style-type: none"> ➤ Adrenal steroids <p>3.3. Natural and Synthetic Hormones</p>		answering	
4	<p>0. 4. Oestrous Cycle</p> <p>4.1. Stages, Duration, Functional events</p> <p>4.2. Estrus –</p> <ul style="list-style-type: none"> ➤ Duration; ➤ External and Internal changes <p>4.3. Hormonal control of Estrus cycle</p> <p>4.4. Heat Detection Methods</p> <p>4.5. Estrus synchronization</p> <ul style="list-style-type: none"> ➤ Prostaglandins and synthetic Progestogens <p>4.6. Follicular growth, Egg maturation and ovulation</p>	<ul style="list-style-type: none"> ✓ Introducing the stages of Estrous cycle and their duration ✓ Brainstorming ✓ Lecturing on heat detection methods and estrus synchronization ✓ Introducing Follicular growth and Ovulation ✓ Giving reading assignment 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Understand the functional events happening in each stages of estrous cycle ✓ Describe heat detection methods and estrus synchronization ✓ Understand Follicular growth, maturation and ovulation
5	<p>5. Physiology of Fertilization</p> <ul style="list-style-type: none"> ➤ Egg and sperm Transport, capacitation of spermatozoa ➤ Acrosome Reaction; Fertilization, Cleavage ➤ Maternal recognition of pregnancy and Implantation ➤ Placenta and placental membranes ➤ Role of fetal fluids in pregnancy ➤ Fetal Development 	<ul style="list-style-type: none"> ✓ Introduce the physiology of fertilization ✓ Brainstorming ✓ Lecturing on post fertilization events and fetal development ✓ Give reading assignment 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Able to describe the physiology of fertilization and fetal development

<p>6</p>	<p>6. Pregnancy Diagnosis</p> <p>6.1. Gestation periods Across species</p> <p>6.2. Methods of pregnancy diagnosis</p> <ul style="list-style-type: none"> ➤ Rectal palpation; ➤ Vaginal Examination, ➤ Histological changes; ➤ Radiological; ➤ Hormonal; ➤ Biochemical; ➤ Ultrasonography. ➤ External Examination. <p>6.3. Differential Diagnosis</p>	<ul style="list-style-type: none"> ✓ Lecturing on gestation periods of different animals ✓ Group discussion ✓ Lecture on methods of pregnancy diagnosis ✓ Brainstorming ✓ Introducing differential diagnosis of pregnancy ✓ Giving reading assignment 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Understand gestation periods of different domestic animals ✓ Describe Methods of pregnancy diagnosis ✓ Know the differential diagnosis
<p>7&8</p>	<p>7. Partuition</p> <p>7.1. Definition and Factors initiating parturition</p> <p>7.2. Presentation; position; posture</p> <p>7.3. Stages of parturition</p> <p>7.4. Induction of parturition</p> <p>7.5. Uterine involution and post partum Estrus</p>	<ul style="list-style-type: none"> ✓ Lecturing on the definition and initiation of parturition ✓ Group discussion ✓ Lecture on presentation, position and posture of the fetus through the birth canal ✓ Introducing stages and Induction of parturition ✓ Brainstorming ✓ Introducing Uterine involution and other post parturient events 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Describe the physiology of parturition ✓ Understand induction of parturition ✓ Describe Uterine involution and other post parturient events

<p>9&10</p>	<p>8. Diseases and Accidents of Gestation</p> <p>8.1. Abortion 8.2. Fetal Mummification and maceration 8.3. Dropsy of fetal membranes and fetus 8.4. Uterine torsion 8.5. Antepartum Vagino-cervical prolaps 8.6. Ventral Hernia</p>	<p>✓ Lecture on common disorders of gestation</p> <p>✓ Class discussion</p> <p>✓ Giving reading assignment</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p>	<p>✓ Describe the common disorders of gestation</p>
<p>11</p>	<p>9. Puerperal Diseases</p> <p>9.1. Retained fetal Membranes 9.2. Prolapse of Uterus 9.3. Post partum infections ➤ Metritis ➤ Endometritis ➤ Septic Metritis ➤ Cervicitis ➤ Vaginitis 9.4. Pyometra</p>	<p>✓ Introduce common puerperal diseases</p> <p>✓ Brainstorming</p> <p>✓ Group discussion</p> <p>✓ Give reading assignment</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion</p>	<p>✓ Understand the common puerperal diseases</p>
<p>12&13</p>	<p>10. Infertility</p> <p>10.1. Anestrus and Repeat Breeding 10.2. Ovarian Hypoplasia; segmental Aplasia of Mullerian duct system and Freemartins. 10.3. Cystic ovarian Degeneration/ ovulation failure; early embryonic Death 10.4. Male factors in female infertility 10.5. Nutritional and Managemental factors 10.6. Infectious infertility</p>	<p>✓ Introducing the meaning of infertility</p> <p>✓ Lecture on different types and factors of infertility</p> <p>✓ Group discussion</p> <p>✓ Giving Reading assignment</p>	<p>✓ Listen lecture and take notes from the lecture</p> <p>✓ Forward all doubts relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion</p>	<p>✓ Able to define infertility</p> <p>✓ Describe types and factors of infertility</p>

14&15	11. Dystocia 11.1. Causes of dystocia ➤ Basic causes ➤ Immediate causes 11.2. Obstetrical Instruments 11.3. Fetal Malpositions; Abnormal posture and presentation 11.4. Obstetrical Procedures ➤ Manipulative delivery ➤ Fetotomy ➤ Caesarean section ➤ Ovariohysterectomy 11.5. Dystocia across different species of animals	✓ Introducing the meaning of dystocia ✓ Lecture on causes and methods of correction of dystocia ✓ Class discussion ✓ Introducing dystocia in different species of animals	✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion and classwork	✓ Understand and Describe different causes and methods of correction of dystocia
16	12. Reproductive Technology 12.1. Artificial Insemination 12.2. Embryo Transfer Technology 12.2.1. Steps of Embryo Transfer Technology ➤ Selection of donor Animals ➤ Super ovulation and Estrus synchronization ➤ Embryo collection, Evaluation and Transfer	✓ Introducing Artificial Insemination ✓ Class discussion ✓ Lecture on Embryo transfer technology ✓ Giving Reading assignment	✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment ✓ Group discussion	✓ Understand and describe artificial insemination and embryo transfer technology
Final exam				

4.2.assessment strategies and techniques and courses policy

Assessment

➤ Quiz	7%
➤ Test.....	8%
➤ Assignment.....	10%
➤ Mid exam.....	25%
➤ Final exam.....	50%
➤ Total	100%

Courses policy

3. Student has to

- ✓ Attend 85% of the class

- ✓ take all continuous assessment and mid exam
- ✓ Take final exam
- ✓ Respect all rules and regulation of the university

9. References

1. Hafez, E.S.E. 1993. Reproduction in Farm Animals. 6th Ed. Lea andFebiger, Philadelphia.
2. Arthur, G.H., D.E. Noakes & H. Pearson 1989. Veterinary Reproductionand Obstetrics, 6th Ed. Bailliere Tindall,London
3. Roberts, S.J., 1986. Veterinary Obstetrics and Genital Diseases. 2nd Ed., Edwards Brothers, Inc., Ann. Arbor. Michigan,USA
4. Bearden, H.J., Fuquay, J.W., and Williard, S.T. 2004. Applied Animal reproduction.

SCHEDULE OF PRACTICAL/ LABORATORY

Week	Practical work	Tasks	Due date for submission of report
1	Demonstration and palpation of female reproductive organs	Report Writing	3
2	Pregnancy diagnosis	Report Writing	4
3	Induction of parturition	Report Writing	5
4	Farm visits	Report Writing	6
5	Artificial Insemination centre Visit	Report Writing	7
6	Case attendance in the clinic: to see various reproductive problems and diseases		8

Approval section

	Name	Signature
Chair holder		
Department head		

Apiculture and bee diseases



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

Course Information

Module Name	Fish and Honey bee production and disease				
Module No.	13				
Course Title	Apiculture and bee diseases				
Course code	Vtsc-3131				
Credits hour (Cr hr) ECTS	Cr Hrs=2	Lecture Hrs=1.5	Laboratory=0.5	Home study=4	Cp/ECTS=3
Semester	II				
Year	3				
Target group	Bachelor of Veterinary Science				
Pre-requisites	None				
Status of the course	Required				
Instructor name and address					

2. Course description

Lectures: the course Apiculture and bee diseases deals with the biology like anatomy, physiology, colony organization, classification and communication of honey bee, and major honey bee diseases and enemies that threaten the apiculture sector. It also deals with the type of beekeeping, honey bee management and major hive products.

Practical: Visiting the apiary/bee farm, familiarize with equipment's used in beekeeping and diagnosing the common honey bee diseases and enemies.

3. Course objectives

At the end of the course students should:

- Describe the types and development of bee keeping in Ethiopia;

- Discuss the biology, breeding, social organization and foraging behavior of honey bees
- Describe specific honeybee diseases, pests and poisoning with respect to control and prevention

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1	Chapter 1: Introduction to apiculture 1.1 Definition of terms 1.2 Advantages and disadvantages of Beekeeping 1.3 Beekeeping in Ethiopia	✓ Brainstorming about apiculture ✓ Lecture on common terminologies in apiculture, advantages and disadvantages of Beekeeping, and beekeeping in Ethiopia ✓ Providing short note on common terminologies in apiculture, advantages and disadvantages of Beekeeping, and beekeeping in Ethiopia	✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/do ubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Familiarized with common terminologies in apiculture ✓ Understand advantage and disadvantage of beekeeping. ✓ Understand challenges and opportunities of beekeeping in Ethiopia
2,3	Chapter 2. Biology of the honey bee 2.1 Taxonomic classification of honey bee 2.2 Species of honey bees 2.3 Races (sub	✓ Brainstorming about biology of honey bee ✓ Lecture on taxonomic classification of honey bee, species and races of honey bees ✓ Providing short note on taxonomic classification of honey bee, species	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture	✓ Understand the taxonomic classification of honey bee ✓ Discuss the species and races of honey bees in the world,

	species) of honey bees	and races of honey bees	<ul style="list-style-type: none"> ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	Africa and Ethiopia
4	Chapter 3: Anatomy and Physiology of Honeybees 3.1 Anatomy of honey bee 3.2 Physiology of honey bees	<ul style="list-style-type: none"> ✓ Brainstorming about the anatomy and physiology of honey bee ✓ Lecture on anatomy and physiology of honey bee ✓ Providing short note on anatomy and physiology of honey bee 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand the anatomy and physiology of honey bee ✓ Discuss the role each anatomical features in the physiology of honey bee
5	Chapter 4. The colony organization of the honey bees 4.1 Development stages of honeybees 4.2 Casts of honey bees and their	<ul style="list-style-type: none"> ✓ Brainstorming about colony organization of honey bee ✓ Lecture on developmental stage of honey bee and casts of honey bee ✓ Providing short note on developmental stage of 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture 	<ul style="list-style-type: none"> ✓ Understand the life cycle of honey bee ✓ Discuss the casts of honey bee ✓ Discuss the role of each cast in the

	organization	honey bee and casts of honey bee	<ul style="list-style-type: none"> ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading 	colony
6,7	Chapter 5. Honeybee behavior and communication 5.1. Swarming, absconding and supersedure 5.2 Communication in Honey Bees	<ul style="list-style-type: none"> ✓ Brainstorming about honey bee behaviors and communication in the colony ✓ Lecture on honey bee behaviors and honey bee communication ✓ Providing short note on honey bee behaviors and honey bee communication 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand honey bee behaviors and how honey bees communicate ✓ Discuss means of communication in honey bees
8	Chapter 6. Apiary site selection 6.1 Factors to be considered for determining an ideal site for beekeeping 6.2 Apiary management 6.3 Apiary site improvement	<ul style="list-style-type: none"> ✓ Brainstorming about apiary site selection ✓ Lecture on apiary site selection, apiary management and improvement ✓ Providing short note on apiary site selection, apiary management and improvement 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer 	<ul style="list-style-type: none"> ✓ Discuss factors to be considered in apiary site selection ✓ Understand apiary management ✓ Discuss means of improving the

			question ✓ Take part on reading assignment	apiary site
9	Chapter 7. Types of beekeeping 7.1 Traditional beekeeping 7.2. Transitional beekeeping 7.3 Modern Bee keeping	✓ Brainstorming about the types of beekeeping ✓ Lecture on traditional, transitional and modern beekeeping ✓ Providing short note on traditional, transitional and modern beekeeping	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Understand the traditional, transitional and modern beekeeping ✓ Discuss the advantage and disadvantages of each beekeeping types
10	Chapter 8. Beekeeping equipment's 8.1 Major beekeeping equipment's and their uses	✓ Brainstorming about equipment's used in beekeeping ✓ Lecture on equipment's used in beekeeping and their use ✓ Providing short note on equipment's used in beekeeping and their use	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/do ubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question	✓ Familiarized with equipment's used in beekeeping and their use

			✓ Take part on reading assignment	
11	Chapter 9. Bee forage and hive products 9.1 Bee forage 9.1. Hive products	✓ Brainstorming about bee forages and hive products ✓ Lecture on common bee forages and hive products ✓ Providing short note on common bee forages and hive products	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Discuss common honey bee forages ✓ Discuss common hive products with their functions
12,13, 14,15	Chapter 10: honey bee diseases and enemies 10.1 Types of honeybee diseases 10.1.1 Brood diseases 10.1.2 Adult honeybee diseases 10.1.3 Honey bee pests 10.1.4 Honey bee	✓ Brainstorming about honey bee diseases and enemies ✓ Lecture on brood and adult honey bee diseases, honey bee pests and predators, and honey bee poisoning ✓ Providing short note on brood and adult honey bee diseases, honey bee pests and predators, and honey bee poisoning	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading	✓ Discuss common brood and adult honey bee diseases honey bee pests and predators, and honey bee poisoning ✓ Understand the common prevention and control

	Predators 10.1.5 Honey bee poisoning		assignment	approaches of honey bee diseases and enemies ✓ Discuss the best treatment options for honey bee diseases
16	Final exam			

4.2.assessment strategies and techniques and courses policy

Assessment

✓ Quiz	7%
✓ Test.....	8%
✓ Assignment.....	10%
✓ Mid exam.....	25%
✓ Final exam.....	50%
✓ Total	100%

Courses policy

Student has to

- Attend 85% of the class
- take all continuous assessment and mid exam
- Take final exam
- Respect all rules and regulation of the university

0. References

1. Leven L.V., Boot W.J., Mutsaers M., Segeren P., Velthuis H. (2005): Beekeeping in the tropics. CTA the Netherlands.
2. Stephen A. (1984). The Golden Insects: a handbook of keeping for beginners. TCC and intermediate technology publications.
3. Hooper T. (2010): Guide to bees and honey. The World's Best Selling Guide to Beekeeping.
4. Fichtl R. and Adi A. (1994): Honey bee flora of Ethiopia.
5. Crane, E. (1990): Bees and beekeeping, Science, Practice and World Resources.

1. Propose practical activity for Apiculture and bee diseases

1. Bee farm/Apiary visit
2. Demonstration of common equipment's used in beekeeping
3. Demonstration of basic techniques used to diagnose honey bee diseases and enemies

Approval section		
	Name	Signature
Chair holder		
Department head		

Fisheries and fishes diseases



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Fish and Honey bee production and disease				
Module No.	13				
Course Title	Fisheries and fishes diseases				
Course code	Vtsc4132				
Credits hour (Cr hr)	Cr Hrs=2	Lecture Hrs=1.5	Laboratory=0.5	Home study=4	Cp/ECTS=3
ECTS					
Semester	I				
Year	IV				
Target group	Bachelor Veterinary Science				
Pre-requisites	None				
Status of the course	Compulsory				
Instructor name and address					

2. Course description

Lecture: An overview on Ethiopian aquatic ecosystems with respect to its importance for fish production; Fish fauna of Ethiopia, Basic anatomy and physiology of bony fish (teleosts); Aquaculture; fish farming/culture methods, management/husbandry of fresh water fish; Nutrition, feeding habits and feeds of fish, Fishing methods, handling, processing, preservation, transport inspection and marketing of

fish. Major health problems of fresh water fish, Diagnostic and treatment principles in Aquatic Medicine, disease entities of freshwater fish (parasitic, bacterial, fungal and viral infections) with respect to their etiology, epidemiology, diagnostic procedures, treatment, and control and prevention. Health problems of fish due to environmental and nutritional disorders.

Practical: Identification of different types of fish, dissection of fish, post-mortem examination techniques, examination of fish sample, tissue sampling (Biopsy) techniques, faecal and blood sampling techniques, parasitological and microbiological examination of fish specimens

3. Course objectives

At the end of the course students should:

- Be able to understand the general biology (anatomy and physiology), production technique and management of fresh water fish;
- Familiarize with different methods of diagnosing fish disease
- Identify fish health problems prevalent in Ethiopia and apply the possible treatment, control and prevention measures

4. Syllabus Components

4.1. Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	<p>Chapter 1. Introduction</p> <p>Ethiopian fisheries, status and constraints</p> <p>1.1 Ethiopian fresh water Ecosystems and fish fauna</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Ethiopian fresh water Ecosystems and fish fauna ✓ Lecture on Ethiopian fresh water Ecosystems and fish fauna ✓ Providing short note on Ethiopian fresh water Ecosystems and fish fauna 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Familiarized with Ethiopian fresh water Ecosystems and fish fauna
2	<p>Chapter 2. Aquaculture and fish farming/culture systems</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Aquaculture and fish farming/culture systems ✓ Lecture on Aquaculture and 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/dou 	<ul style="list-style-type: none"> ✓ Familiarized and understand Aquaculture and fish farming/culture systems

		<p>fish farming/culture systems</p> <p>✓ Providing short note on Aquaculture and fish farming/culture systems</p>	<p>bts</p> <p>✓ pear idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	
3	<p>Chapter 3.</p> <p>Management/husbandry of fresh water fish</p> <p>3.1 Nutrition, feeding habits and feeds of fish</p> <p>3.2 Fishing methods and handling of fish</p>	<p>✓ Brainstorming about Management/husbandry of fresh water fish</p> <p>✓ Lecture on Management/ husbandry of fresh water fish</p> <p>✓ Providing short note on Management/ husbandry of fresh water fish</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all confusion/doubts</p> <p>✓ pear idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>✓ understand Management/husbandry of fresh water fish</p> <p>✓ practice management /husbandry of fresh water fish</p>
4	<p>3.3 Processing, preservation, transport, inspection and marketing of fish</p>	<p>✓ Brainstorming about Fishing & handling of fresh water fish</p> <p>✓ Lecture on Fishing & handling of fresh water fish</p> <p>✓ Providing short note on Fishing & handling of fresh water fish</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all confusion/doubts</p> <p>✓ pear idea sharing</p> <p>✓ Ask & answer question</p>	<p>✓ understand Fishing & handling of fresh water fish</p> <p>✓ practice Fishing & handling of fresh water fish</p>

			✓ Take part on reading assignment	
5	Chapter 4. Basic anatomy and physiology of fish (Teleosts)	<ul style="list-style-type: none"> ✓ Brainstorming about Anatomy & physiology of fish ✓ Lecture on Anatomy & physiology of fish ✓ Providing short note on Anatomy & physiology of fish 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	✓ understand Anatomy & physiology of fish
6	Chapter 5. Diagnostic and treatment principles in Aquatic Medicine	<ul style="list-style-type: none"> ✓ Brainstorming about Diagnosis & treatment principles in aquatic medicine ✓ Lecture on Diagnosis & treatment principles in aquatic medicine ✓ Providing short note on Diagnosis & treatment principles in aquatic medicine 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question ✓ Take part on reading 	✓ understand Diagnosis & treatment principles in aquatic medicine

			assignment	
7	<p>6. Major diseases of fish</p> <p>6.1 Major parasitic diseases in fresh water fish</p> <p>6.1.1 Arthropod infestation (copepod infestation, Isopod infestation)</p>	<p>✓ Brainstorming about Major arthropods in fresh water fish</p> <p>✓ Lecture on Major arthropods in fresh water fish</p> <p>✓ Providing short note on Major arthropods in fresh water fish</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all confusion/doubts</p> <p>✓ peer idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>✓ understand Major arthropods in fresh water fish</p> <p>✓ Able to identify & treat Major arthropods in fresh water fish</p>
8	<p>6.1.2 Helminth infections of fish (Monogenean and Digenean infections, Nematode, Flukes, cestodes)</p>	<p>✓ Brainstorming about Helminthic parasites in fresh water fish</p> <p>Lecture on Helminthic parasites in fresh water fish</p> <p>Providing short note on Helminthic parasites in fresh water fish</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all confusion/doubts</p> <p>✓ peer idea sharing</p> <p>✓ Ask & answer question</p> <p>✓ Take part on reading assignment</p>	<p>understand Helminthic parasites in fresh water fish</p> <p>Able to identify & treat Helminthic parasites in fresh water fish</p>

9	6.1.3 Protozoan infections of fish	<ul style="list-style-type: none"> ✓ Brainstorming about Protozoal parasites in fresh water fish ✓ Lecture on Protozoal parasites in fresh water fish ✓ Providing short note on Protozoal parasites 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts ✓ peer idea sharing 	<ul style="list-style-type: none"> ✓ understand Protozoal parasites in fresh water fish ✓ Able to identify & treat Protozoal parasites in fresh water fish
10	6.2 Major Bacterial diseases of fresh water fish 6.2.1 General features of bacterial infection <ul style="list-style-type: none"> ✓ Columnaris infection ✓ Bacterial gill disease ✓ Epitheliocystis 	<ul style="list-style-type: none"> ✓ Brainstorming about bacterial disease of fresh water fish ✓ Lecture on bacterial disease of fresh water fish ✓ Providing short note on bacterial disease of fresh water fish 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ understand bacterial disease of fresh water fish ✓ Able to identify & treat bacterial disease of fresh water fish
11	Bacterial diseases of fresh water fish <ul style="list-style-type: none"> ✓ Motile Aeromonad Infection (MAI) ✓ Enteric septicemia of cat fish 	<ul style="list-style-type: none"> ✓ Brainstorming about bacterial disease of fresh water fish ✓ Lecture on bacterial disease of fresh water fish ✓ Providing short note on bacterial disease of fresh water fish 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer 	<ul style="list-style-type: none"> ✓ understand bacterial disease of fresh water fish ✓ Able to identify & treat bacterial disease of fresh water fish

12	Bacterial diseases of fresh water fish ✓ Edwardseilosis ✓ Yersiniosis ✓ Mycobacteriosis	✓ Brainstorming about bacterial disease of fresh water fish ✓ Lecture on bacterial disease of fresh water fish ✓ Providing short note on bacterial disease of fresh water fish	✓ Listen the lecture & take notes from the lecture ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question	✓ understand bacterial disease of fresh water fish ✓ Able to identify & treat bacterial disease of fresh water fish
13	6.3 Major Fungal infections of fresh water fish Typical water mold infection Atypical water mold infection Branchiomycosis (gill rot)	✓ Brainstorming about Fungal disease of fresh water fish ✓ Lecture on Fungal disease of fresh water fish ✓ Providing short note on Fungal disease of fresh water fish	✓ Listen the lecture & take notes from the lecture ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question	✓ understand Fungal disease of fresh water fish ✓ Able to identify & treat Fungal disease of fresh water fish
14	6.4 Major Viral diseases of fresh water fish 6.4.1 General features Channel cat fish virus disease • Grass carp reo virus • Spring Viremia of carp	✓ Brainstorming about Viral disease of fresh water fish ✓ Lecture on Viral disease of fresh water fish ✓ Providing short note on Viral disease of fresh water fish	✓ Listen the lecture & take notes from the lecture ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question	✓ understand Viral disease of fresh water fish ✓ Able to identify & treat Viral disease of fresh water fish

15	7. Health problems due to environmental and nutritional disorders	✓ Brainstorming about Health problems due to environmental and nutritional disorders ✓ Lecture on Health problems due to environmental and nutritional disorders ✓ Providing short note on Health problems due to environmental and nutritional disorders	✓ Listen the lecture & take notes from the lecture ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ understand Health problems due to environmental and nutritional disorders ✓ Able to identify & treat Health problems due to environmental and nutritional disorders
16	Final exam			

4.2.assessment strategies and techniques and courses policy

Assessment

✓ Quiz	7%
✓ Test.....	8%
✓ Assignment.....	10%
✓ Mid exam.....	25%
✓ Final exam.....	50%
✓ Total	100%

Courses policy

Student has to

- Attend 85% of the class
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- Take final exam
- Respect all rules and regulation of the university

References

1. Edward J. Noga, Mosby-year book, Inc (1995) Fish Disease: Diagnosis and treatment.
2. PTK Woo. (1995) **Fish diseases and disorders** Volume 1- **Protozoan and Metazoan infections:** Department of Zoology, University of Guelph, Canada
3. J.F. Leatherland and P.T.K. Woo (1998). **Fish diseases and disorders** Volume 2- **Non-infectious Disorders:** Ontario Veterinary College Department of Zoology, University of Guelph, Canada, CABI Publishing
4. P T K Woo, (1999.). **Fish diseases and disorders** Volume 3- Viral, Bacterial and Fungal infections Department of Zoology, University of Guelph, Canada, and D W Bruno, Scottish Office Agriculture, Environment and Fisheries Department, Aberdeen, UK, CABI Publishing

Propose practical activity

- Identification of different types of fish,
- Dissection of fish, post-mortem examination techniques,

- Examination of fish sample, Tissue sampling (Biopsy) techniques,
- Faecal and blood sampling techniques,
- parasitological and microbiological examination of fish specimens

Approval section

	Name	Signature
Chair holder		
Department head		

Biostatistics and Research Methods



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Research Tools in Veterinary Science				
Module No.	14				
Course Title	Biostatistics and Research Methods				
Course code	VtscS4141				
Credit Hrs/ECTS	Cr Hrs=3	Lecture Hrs=2	Practical =1	Home study=7	Cp/ECTS=5
Semester	I				
Year	IV				
Pre-requisites	No				
Target group	Bachelor of Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course description

- ✓ This course addresses an overview of introductory biostatistics and research methods which includes, application of statistical knowledge in research protocol development, estimation and hypothesis testing, assessing statistical significance, estimation of sample size, introduction to analysis of categorical data and continuous data
- ❖ Lectures: the lecture deals application of statistical knowledge in research protocol development, estimation and hypothesis testing, assessing statistical significance, estimation of sample size, introduction to analysis of categorical data and continuous data
- ❖ **Practical** : collect and store data, minor data analysis and interpretation with Excel

3. Objectives of the Courses

At the end of the course students should:

- ✓ know and understand the basic concepts of biostatistics
- ✓ Discuss different methods of data collection
- ✓ Be familiar with data presentation and summarization techniques
- ✓ be familiar with research design
- ✓ be familiar with the skills of collecting, summarizing, analyzing, interpreting and presenting data\
- ✓ independently be able to choose appropriate statistical test and conduct the test
- ✓ make a statistical inference
- ✓ be able to determine correct sample size

4. Syllabus Components

4.1. Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	student tasks	Learning out come (Students be able to;)
1 & 2	Chapter 1: Introduction to Biostatistics: 1.1. Classification of statistics and definition of some terms 1.2. Types of variables and Measuring Scale 1.3. Methods of Data collection and Presentation	✓ Provide lecture notes, ✓ group discussion ✓ Provide assignment	✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts trainee may have in relation to the given lecture, ✓ take part in discussions	✓ familiar with the application of biostatistics ✓ familiar with types of variables and their measuring Scale ✓ familiar with methods data collection and Presentation
3	Chapter 2: Measures of Central Tendency and Dispersion 2.1. Measures of Central Tendency 2.2. Measures of Non-central locations 2.3. Measures of dispersion	✓ Provide Lecture notes, ✓ Group discussions ✓ Provide assignments	✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts trainee may have in relation to the given lecture, ✓ take part in discussions	✓ understand the applications of measures of Central tendency ✓ understand the applications of non-central locations ✓ understand the applications of measures of dispersion
4	Chapter 3: Probability and probability distributions 15.1. Probability 15.2. Probability distributions	✓ Provide Lecture notes, ✓ Group discussions ✓ Provide assignments	✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts trainee may have in relation to the given lecture, ✓ take part in discussions	✓ understand the application of probability ✓ understand types of probability distributions and their applications
5	Chapter 4: Sampling Strategy and Sample size determination	Provide Lecture notes, Group discussions Provide assignments	✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts trainee may have in	✓ familiar with sampling strategies ✓ familiar with Sample size

	4.1. Sampling strategy 4.2 Sample size estimation		relation to the given lecture, ✓ take part in discussions	determination
6 & 7	Chapter 5: Estimation and Hypothesis Testing 5.1. Point and interval estimation 5.2. Hypothesis testing	Provide Lecture notes, Group discussions Provide assignments	✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts trainee may have in relation to the given lecture, ✓ take part in discussions	✓ understand the principle of estimation and hypothesis testing
8&9	Chapter 6: Principles of Field Experimentation 6.1. Applications of Experimental study designs	Provide Lecture notes, Group discussions Provide assignments	✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts trainee may have in relation to the given lecture, ✓ take part in discussions	✓ familiar with the principles of field experimentation and experimental study designs
10 & 11	Chapter 7: Analysis of continuous data 3.1. t-test and ANOVA 3.2. Correlation 3.3. Simple and multiple Linear regression	Provide Lecture notes, Group discussions Provide assignments	✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts trainee may have in relation to the given lecture, ✓ take part in discussions	✓ familiar with how to analyze continuous data
12 & 13	Chapter 8: Analysis of categorical and count data 4.1. Chi-square-test 4.2. Fisher's exact test 4.3. Logistic regression 4.4. Poisson regression	1. Provide Lecture notes, Group discussions Provide assignments	✓ Listen to a lecture and take notes on the lesson, ✓ Forward all the confusion or doubts trainee may have in relation to the given lecture, ✓ take part in discussions	✓ familiar with how to analyze categorical and count data

14	Chapter 9. Non-parametric statistical tests	Provide Lecture notes, Group discussions Provide assignments	<input checked="" type="checkbox"/> Listen to a lecture and take notes on the lesson, <input checked="" type="checkbox"/> Forward all the confusion or doubts trainee may have in relation to the given lecture, <input checked="" type="checkbox"/> take part in discussions	<input checked="" type="checkbox"/> Familiar with the applications of non-parametric statistical tests
15	Chapter 10. Research protocol development and Ethics 10.1. Research Protocol development 10.2. Scientific paper writing 10.3. Research Ethics	Provide Lecture notes, Group discussions Provide assignments	<input checked="" type="checkbox"/> Listen to a lecture and take notes on the lesson, <input checked="" type="checkbox"/> Forward all the confusion or doubts trainee may have in relation to the given lecture, <input checked="" type="checkbox"/> take part in discussions	<input checked="" type="checkbox"/> Develop research protocols <input checked="" type="checkbox"/> Familiar with scientific paper writing <input checked="" type="checkbox"/> Understand research Ethics
16	Final exam			

4.2.assessment strategies and techniques and courses policy

Assessment

<input checked="" type="checkbox"/> Quiz	7%
<input checked="" type="checkbox"/> Test.....	8%
<input checked="" type="checkbox"/> Assignment.....	10%
<input checked="" type="checkbox"/> Mid exam.....	25%
<input checked="" type="checkbox"/> Final exam.....	50%
<input checked="" type="checkbox"/> Total	100%

Courses policy

Student has to

- Attend 85% of the class
- take all continuous assessment and mid exam
- Take final exam
- Respect all rules and regulation of the university

References

1. Chap.T.LE. 2003. Introductory Biostatistics
2. Aviva Petria and Paul Watson. 2006. Statistics for Veterinary and Animal Sciences. 2nd edition
3. Downie, N.M. and R. W. Heath, 1983. Basic Statistical Methods, 5th Edition. New York:Harper and Row Publ.
4. Moore, D.S., and G.P. McCabe. 1989. Introduction to the Practice of Statistics, New York: W.H. Freeman and Company.

Propose practical activity for Biostatistics and Research Methodology		
✓ Descriptive statistics using excel sheet and SPSS		
Approval section		
	Name	Signature
Chair holder		
Department head		

Seminar on Current topics in Veterinary Science



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Research tools in Veterinary scienc			
Module No.	14			
Course Title	Seminar on Current topics in Veterinary Science			
Course code	Vtsc-4142			
Credit Hrs/ECTS	Cr Hrs=1	Lecture Hrs=0	Practical =1	Home study=3 Cp/ECTS=2
Semester	II			
Year	IV			
Pre-requisites	No			
Target group	Bachelor of Veterinary Science			
Status	Compulsory			
Instructor name and address				

2. Course Description

The student will undertake a literature review work on the topic he/she has been identified in the second semester of final year. The execution of the literature review work might be on areas related to Animal health, veterinary drugs and overall livestock management. He/she will be assigned academic advisor who can guide him/her during topic identification, writing and defense. The student will defend the seminar to the rest of the students and the academic staff.

3. Objectives of the Courses

At the end of the course student should able to:

- ✓ Acquaint students on how to write scientific papers.
- ✓ Develop the skills and confidence of students during presenting papers.

4. Syllabus Components

4.1. Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
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1	Chapter 1: Scientific Paper Writing 1.1. Guidelines to Scientific Paper Writing 1.2 Topic/title selection	<input checked="" type="checkbox"/> Provide lecture notes on how to write Scientific Paper <input checked="" type="checkbox"/> Group discussion	<input checked="" type="checkbox"/> Listen the lecture and take notes from the lesson <input checked="" type="checkbox"/> Forward all the confusion/doubts in relation to the Guidelines <input checked="" type="checkbox"/> Take part in title selection	<input checked="" type="checkbox"/> Familiar with literature review
2,3	<input checked="" type="checkbox"/> Advisor support <input checked="" type="checkbox"/> Final examination /Paper presentation	<input checked="" type="checkbox"/> Writing review <input checked="" type="checkbox"/> Provide feed back	<input checked="" type="checkbox"/> Take part in paper writing	<input checked="" type="checkbox"/> Understand Scientific Paper Writing <input checked="" type="checkbox"/> Develop confidence

4.2.assessment strategies and techniques and courses policy

Assessment	
✓ Over all paper	60%
✓ Presentation/defense.....	40%
✓ Total	100%

Courses policy	
Student has to	
<ul style="list-style-type: none"> • Write seminar • Take presentation or defense • Respect all rules and regulation of the university 	

References

Approval section		
	Name	Signature
Chair holder		
Department head		

Senior Research Project



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Research tools in Veterinary science			
Module No.	14			
Course Title	Senior Research Project			
Course code	Vtsc-4143			
Credit Hrs/ECTS	Cr Hrs=3	Lecture Hrs=2	Practical =3	Home study=5 Cp/ECTS=5
Semester	II			
Year	IV			
Pre-requisites	No			
Target group	Bachelor of Veterinary Science			
Status	Compulsory			
Instructor name and address				

2. Course Description

The student will undertake a research work on the topic he/she has been identified in the second semester of final year. The execution of a research work will be based on the proposal that has been developed. Finally, the student will present and his research outcomes and submit the written document to his/her academic advisor.

3. Objectives of the Courses

At the end of the course student should able to:

- ✓ Acquaint students on how to conduct research.
- ✓ Develop the skills and confidence of students during presenting scientific papers.

4. Syllabus Components

4.1. Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1,2	Chapter 1: Senior research project 1.1. guidelines for the Senior Research Paper 1.2. Guidelines to Scientific knowledge investigation 1.3 Topic/title selection	✓ Provide lecture notes on how to write Senior Research Paper ✓ Group discussion	✓ Listen the lecture and take notes from the lesson ✓ Forward all the confusion/doubts in relation to the Guidelines ✓ Take part in title selection	✓ Familiar how to perform research

3,4,	✓ Proposal writing	✓ Provide feed back ✓ Advisor support	✓ Take part in proposal writing	✓ Understand Proposal writing
5,6,7,8,	✓ Data collection ✓ Analysis	✓ Advisor support ✓ Provide feed back	✓ Take part in data collection	✓ Familiar with data collection and analysis
9,10,11, 12,13,14, 15,	✓ Paper write up ✓ Paper submission	✓ Advisor support ✓ Provide feed back ✓	✓ Take part in paper writing ✓ Submit with hard copy	✓ Familiar with Scientific Paper Writing
16	✓ Final examination /Paper presentation	✓ Advisor support ✓ Provide feed back	✓ Present their paper	✓ Develop confidence

4.2.assessment strategies and techniques and courses policy

Assessment

- ✓ Over all paper60%
- ✓ Presentation/defense.....40%
- ✓ Total100%

Courses policy

Student has to

- Perform senior research project
- Take presentation or defense
- Respect all rules and regulation of the university

References

- ✓ Use **University Guidline**

Approval section

	Name	Signature
Chair holder		
Department head		

Veterinary Public Health



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Veterinary Public Health				
Module No.	15				
Course Title	Veterinary Public Health				
Course code	Vtsc- 4151				
Credit Hrs/ECTS	Cr Hrs=3	Lecture Hrs=2	Laboratory=1	Home study=7	Cp/ECTS=5
Semester	I				
Year	IV				
Pre-requisites	None				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

This course covers veterinary public health mean, food hygiene and principles of food preservation, meat hygiene, milk and milk hygiene, zoonosis diseases. To this contents the course will be offered through lecture method, group, discussion, Buzz group, discussion, brainstorming and participatory teaching and learning approaches as well as reading assignments and short note provision. Student progress will be assessed both in formative and summative way of evaluation.

Lectures: The course deals with the veterinary public health means, food hygiene and principles of food prevention, meat hygiene, milk and milk hygiene, zoonosis diseases.

Practical: identification of food spoilage, identification of chemical residues on food, observation of ante mortem and post mortem examination, detection of oedema with alcohol floatation test, determination of fat rancidity (with neutral red) and detection of icterus, determination of PH of meat, microbial examination of meat and meat products, detection of antibiotic residues in meat, examination of milk and milk products such as determining the freshness and adulteration of milk, and examination of unopened and opened egg.

3. Objectives of the Courses

At the end of the course student should be able to:

- ☞ Clearly understand, analyze and apply the principles food hygiene and veterinary public health practices
- ☞ Elucidate major zoonotic and food borne diseases in the tropics their means of transmission, prevention and control options
- ☞ Design and implement an effective quality assurance practices

4. Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome				
Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1	Chapter 1: Introduction to Veterinary Public Health 1.1. Define Veterinary public health mean 1.2. Duties and responsibilities of VPH at different levels	Brain storming & interactive lecture	✓ Listen the lecture , group take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture	✓ Students understand and define Veterinary public health mean
2,3,4,	Chapter 2: 2. Food contaminants and Principles of Food Hygiene 3.13. Properties of food of animal origin 3.14. Food hygiene 3.15. Food Contaminants 2.3.1.Microbial contamination/ biological hazard : 2.3.2.Non microbial contamination (physical and chemical contamination): 3.16. Effect of microbiological contaminants on food 2.4.1. Food Spoilage 2.4.2. Food Borne Infection and Intoxication (food borne diseases) 2.4.2.1.Bacterial Food borne Infections 2.4.2.2.Viral food born infection 2.4.2.3. Rickettsial foodborne infection	✓ Interactive lecture ,group discussion and case study ✓ Interactive lecture ,group discussion and case study	✓ Interactive following the lecture ,group discussion and case study activities perform ✓ Do the assignments given by lecture ✓	✓ Students able to explain Food hygiene ✓ identify contamination of food ✓ students able differentiate food spoilage ✓ Explain Food born infection ✓ identify food born infection ✓ Distinguish food borne pathogens

	2.4.2.4. Parasitic food borne infection			
5,6,	2.3.3. Food borne intoxications 2.3.3.1. Bacterial food borne intoxications 2.3.3.2. Fungal food borne intoxications 2.3.3.3. Chemical foodborne intoxication 2.3.3.4. Biotoxications 2.4. Non-Microbial Food Contamination 3.17. General hygiene of Food Establishments	<ul style="list-style-type: none"> ✓ Lecture on nature of animal population ✓ Brainstorming ✓ Providing short note 	<ul style="list-style-type: none"> ✓ Interactively following the lecture ,group discussion and case study activities perform ✓ Do the assignments given by lecture ✓ Further home study 	<ul style="list-style-type: none"> ✓ Explain Food born intoxication ✓ identify food intoxication ✓ Distinguish food borne intoxications ✓ identify causes of food borne intoxication
7,	Chapter 3. FOOD PRESERVATION METHODS 3.1. Methods of food preservation 1. Physical Methods 2. Chemical methods 3.2. Hazard Analysis Critical Control Point (HACCP) 3.3. Decision tree to identify HACCP (Flow chart)	<ul style="list-style-type: none"> ✓ Interactive lecture ,group discussion and case study 	<ul style="list-style-type: none"> Interactively following the lecture ,group discussion and case study activities perform ✓ Do the assignments given by lecture ✓ Further home study 	<ul style="list-style-type: none"> understand Principles of food preservation and able to preserve food develop new preservation methods Shows steps in conducting HACCP construct decision tree to HACCP (Flow chart)

8,9	Chapter 4. MEAT HYGIENE 4.1. Meat hygiene 4.2. Pre-slaughter care of slaughter animals 4.3. Construction of Abattoirs, Slaughter Houses and Slaughter slabs 4.4. Stunning Methods 4.5. Meat inspection 4.6. Microbial load of meat 4.7. Poultry Meat Examination 4.8. Egg inspection	✓ Group discussion & case study	✓ Interactively following the lecture ,group discussion and case study activities perform ✓ Do the assignments given by lecture ✓ Further home study	✓ identify Meat hygiene practices ✓ able to Show and conduct ant-mortem and post mortem examination ✓ identify methods Pre-slaughter care of slaughter animals ✓ identify methods of slaughter and bleeding practices ✓ Identify and able to conduct poultry meat and egg inspection
10,11	Chapter 5. MILK AND MILK HYGIENE 5.1. Introduction 5.2. Composition of milk 5.2.1. Chemical composition of Milk 5.3. Physical Properties of Milk 5.4. Microbial flora of milk and milk products 5.4.1. Public Health significance of milk and milk products	✓ Interactive lecture ,group discussion & case study	✓ Interactively following the lecture ,group discussion and case study activities perform ✓ Do the assignments given by lecture ✓ Further home study	✓ identify Composition of milk and its hygiene ✓ Differentiate physical properties of milk and identify its quality ✓ Students able to implement milk

	<p>5.5. Milk adulteration</p> <p>5.6. Milk hygiene practice</p> <p>5.7. Quality control of milk and milk products</p> <p>5.8. Methods used to assess the quality of milk</p>	<p>✓ Interactive lecture ,group discussion & case study</p>		<p>hygiene practice</p> <p>✓ Able Describe public health significance of milk and milk products</p> <p>✓ Able to design quality control of milk and milk products</p>
12-15	<p>Chapter 6: ZONOSES INFECTIONS</p> <p>6.1. Introduction</p> <p>6.2. Classifications of zoonosis diseases</p> <p>6.3. Mode of transmission</p> <p>6.4. Important Zoonotic Diseases of Tropics and sub-tropics</p> <p>6.4.1. Bacterial zoonosis</p> <p>6.4.2. Viral zoonosis</p> <p>6.4.3. Parasitic zoonosis</p> <p>6.5. Public health and economic importance of zoonotic disease</p> <p>6.6. Prevention, Control and Eradication of Zoonotic diseases (there principles)</p>	<p>✓ Group discussion & case study</p> <p>✓ Interactive lecture and case study</p>	<p>✓ Interactively following the lecture ,group discussion and case study activities perform</p> <p>✓ Do the assignments given by lecture</p> <p>✓ Further home study</p>	<p>✓ Differentiate Classification of Zoonoses</p> <p>✓ Identify Mode of transmission of zoonosis</p> <p>✓ Identify Important Zoonotic Diseases of Tropics and sub-tropics</p> <p>✓ Describe Public and Economic Importance of Zoonotic Diseases</p>

16

Final exam

4.2.Assessment Strategies and Techniques and Courses Policy

Assessments

- ✓ Quiz7%
- ✓ Test.....8%
- ✓ Assignment.....10%
- ✓ Mid exam.....25%
- ✓ Final exam.....50%

✓ Total100%

Courses policy

- ✓ **Student has** 80% theoretical class attendance and 100% practical class
- ✓ **General:** Students should be familiar with the University's policies regarding the grading system, withdrawals, exemptions, class assignments, missed tests and exams, attending classes, supplemental privileges, and academic dishonesty

References

GRACEY. J.F., 1999. Meat Hygiene (part one and two). Tenth Edition. W.B. Saunders. Meat hygiene Modern food Microbiology.

HARRYV. H., 1980. Food Quality control. Lowastate University press.

JAMES. N. W., 1976. Principles of dairy processing. Wiley Eastern Limited, Bombay, Calcutta.

Khetarpaul, N. (2012). Food processing and preservation. Daya publishing, new dalhi 110002 (Pages 43-84)

Malecolm. E. C. & Paul .W., 1979. Modern milk production; its principles and Application for students and farmers. London, Boston.

MANN. I., 1984. Guidelines on small slaughterhouses and meat hygiene for developing countries.

MARTI. E. H., 1995. Zoonoses. Lowastate University press.

MITCHELL. J. R., 1980. Guide to Meat inspection in the Tropics. England.

SIVASANKAR. B., 2002. Food processing and preservation. New Delhi, India.

VAN DEN BERG. J.C.T., 1988. Dairy technology in the tropics and sub-tropics. Wageningen, the Netherlands.

WHO/Pan American Health Organization, 2001. Zonoosis and communicable diseases common to Man and Animals. Third Edition. Vol. I

Filed trip to slaughter and milk processing implants in addition to laboratory work (detection of oedema with alcohol floatation test, determination of fat rancidity (with neutral red) and detection of icterus, determination of PH of meat, microbial examination of meat and meat products, detection of antibiotic residues in meat, examination of milk and milk products such as determining the freshness and adulteration of milk, and examination of unopened and opened egg.)

Approval section

	Name	Signature
Chair holder		

Department head		
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Veterinary Clinical Experience



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Internship (General veterinary practice)				
Module No.	16				
Course Title	Veterinary Clinical Experience				
Course code	Vtsc-4161				
Credit Hrs/ECTS	Cr Hrs=2	Lecture Hrs=0	Practical =2	Home study=6	Cp/ECTS=4
Semester	II				
Year	IV				
Pre-requisites	None				
Target group	Bachelor of Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

The course deals with the day-to-day activities in veterinary clinics, in the field, pastoral areas or farms to conduct independently diagnose disease and provide treatment and control of diseases of animals.

3. Objectives of the Courses

At the end of the course student should able to:

- Acquire knowledge in applying clinical medicine to diagnose, treat and control diseases of farm animals
- Acquire skills in applying clinical medicine to diagnose, treat and control diseases of farm animals

4. Syllabus Components

4.1. Course Contents, Methods, Strategies, and Learning Outcome

Wee ks	Content and sub- content	methods, strategies	Student Tasks	Learning out come
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1-13	<ul style="list-style-type: none"> ✓ effective client communications skills & ✓ record a thorough medical history & ✓ Perform a comprehensive physical examination, ✓ Perform diagnosis, ✓ Prescribe treatment, recommend control and prevention measures to the diseases 	<ul style="list-style-type: none"> ✓ Independently communicate with the client & take history ✓ Independently observe the clinical cases ✓ Independently make Physical examination ✓ Independently record every finding on the case paper ✓ Make diagnosis and prescribe appropriate medication 	<ul style="list-style-type: none"> ✓ Communicate with owner to take history ✓ Observation of clinical cases ✓ Physical examination of the case ✓ Recording of the case ✓ Forward all confusion/doubts ✓ peer idea sharing ✓ Ask & answer question 	<ul style="list-style-type: none"> ✓ Familiarized with effective client communications skills & record a thorough medical history ✓ Understand how to conduct physical examination and arrive at diagnosis ✓ Familiarize how to give treatment, & recommend control and prevention measures to the diseases
14-16	<ul style="list-style-type: none"> • Case paper presentation • Oral examination 		<ul style="list-style-type: none"> • Submission of case paper • Oral defense 	<ul style="list-style-type: none"> • Clear recording on case paper • Ability to defend

4.2.assessment strategies and techniques and courses policy

Assessment

- Case report..... 50%
- Oral presentation50%
- Total100%

Courses policy

Student has to

- ✓ Attend 85% of the clinic
- ✓ Present case report and present or defend during oral examination
- ✓ Respect all rules and regulation of the university

References

1. Rdstits, O.M, Gay, C.C., Hinchcliff W.K., Constable, P.D. (2007). Veterinary Medicine: A text book of the disease of cattle, horses, sheep, pigs and goats, 10th ed. Elsevier, London.
2. Merk Veterinary manual (2000).Merck &CO.INC White house station, New jersey, USA
3. Seifert, H.S.M,(1996). Tropical animal health George-August university, Kluver, Academic publication Dordrecht, Germany
4. Bradfor, P.S, (1996). Large Animal internal medicine, 2nd, edn. St. Louis, Missouri USA
5. Howard (1981). Current veterinary therapy; Food Animal practice. WB Saunders, Philadelphia USA.
6. Hungerford. R.G. (1975). Diseases of Livestock 9th ed. Sydney, Australia
7. Parker, W.H (1980). Health and disease in farm animals/3rd ed. Pajamas press, oxford England
8. Sewll, M.M.H. and Brockles by, D.W. (1990). Handbook on animal Diseases in tropics, 4th ed. Bailleretindall, London.
9. Kelly, W.R. 1975. Veterinary Clinical diagnosis, 2nd Ed., Bailliere Tindal & Casell, London.
10. Andrews, A.H. 1990. Outline of Clinical Diagnosis in Cattle, Butterworths and Company London.

Pinsent, P.J.N. & C.J. Fuller. 1997. Outline of Clinical Diagnosis in Horse. Blackwell Science, Oxford,
University

Approval section

	Name	Signature
Chair holder		
Department head		

Veterinary Laboratory Work Experience



Bahir Dar University
College of Agriculture and Environmental Science
School of Animal Science and Veterinary Medicine

7. Course Information	
Module Name	Internship (General veterinary practice)
Module No.	16
Course Title	Veterinary Laboratory Work Experience
Course code	Vtsc-4162
Credit Hrs/ECTS	Cr Hrs = 2, Lecture Hr = 0, Laboratory =2, Home study =6, Cp/ECTS=4
Semester	II
Year	IV
Pre-requisites	None
Target group	Bachelor Veterinary Science
Status	Compulsory
Instructor name and address	
8. Course Description:	
The course deals with day-to-day activities in diagnostic and research veterinary laboratories in disease diagnosis and research activities.	
3.Objectives of the Course	
At the end of the course student should able to:	
<ul style="list-style-type: none"> ➤ Acquire knowledge and skills in applying veterinary laboratory techniques for diseases diagnosis and research undertakings ➤ Be familiar with different laboratory diagnostic tools and procedures ➤ Be able to perform various laboratory tests, interpret test results and correlate with history and clinical signs ➤ Enhance the mastery of Laboratory work experience ➤ Develop scientific reasoning abilities related to disease diagnosis ➤ Enhance student understanding of specific scientific facts and concepts and of the way in which these facts and concepts are organized in the respective scientific discipline. ➤ Develop skills for trouble shooting thus leading to a better grasp of underlying theoretical concepts ➤ Develop skills such as experimental design, methodological execution of the experiment, observation, organization and presentation of original results ➤ Improve teamwork abilities. 	
4.2.Assessment strategies and techniques and courses policy	

Assessment		
✓	Report writing-----	50%
✓	Presentations-----	50%
✓	Total-	100%
Courses policy		
Student has to		
✓	Perform expected laboratory experience	
✓	Take oral examination	
✓	Respect all rules and regulation of the university	
Reference books		
1. Hirsh, D. C. and Zee, Y. N. 1999. Veterinary microbiology, Blackwell Science Inc.		
2. Quinn, P. J.; Markey, B. K.; Carter, M. E.; Donnelly, W. J. C. ; Leonard, F. C. and Maguire, D. 2002. Veterinary Microbiology and Microbial Disease, Blackwell Science Inc.		
3. Quinn, Carter, Markey and Carter, G.R.1999. Clinical Veterinary Microbiology_____		
4. Foreyt, W.J. 2001. Veterinary Parasitology. Reference Manual. 5 th ed.		
5. Gary Mullen and Lance Durden 2002. Medical and Veterinary Entomology		
6, Richard Wall, David Shearer 2001. Veterinary Ectoparasites: Biology, Pathology and Control		
7. Taylor, M.A. <i>et al.</i> 2007. Veterinary Parasitology, 3 rd edition, Blackwell Science Limited..		
Approval section		
	Name	Signature
Chair holder		
Department head		

Farm Experience



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Internship (General veterinary practice)				
Module No.	16				
Course Title	Farm Experience				
Course code	Vtsc-4163				
Credit Hrs/ECTS	Cr Hrs=2	Lecture Hrs=0	Practical =2	Home study=2	Cp/ECTS=2
Semester	II				
Year	IV				
Pre-requisites	None				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

The course deals with the day-to-day activities of livestock management, feeding and overall farm husbandry practice in different livestock production systems

Practical: Applying different types of feeding and overall farm husbandry practice

3. Objectives of the Courses

At the end of this course, students should be able to:

- ✓ Acquire knowledge and skills in farm management practices and production systems
- ✓ Familiar with the over whole activities in the farm operations
- ✓ Identify the challenges and opportunity of the livestock farm

4. Syllabus Components

4.1. Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1	Practical Attachment	<ul style="list-style-type: none"> ✓ Provide information on how to perform farm experiences ✓ Group discussion 	<ul style="list-style-type: none"> ✓ Listen the introduction and take notes from introduction ✓ Forward all the confusion in relation to farm experience 	<ul style="list-style-type: none"> ✓ Familiar with farm management practices

2,3,4,5,6, 7,8,9,10, 11,12,13, 14	Practical Attachment	✓ ✓	Provide feed back Advisor support	✓ ✓	Students will be deployed in different animal farms and fully engaged in gaining farm experiences. Take part in farm management practices	✓	Acquire knowledge and skills in farm management		
15,16	✓ ✓	✓ ✓	Advisor support Final examination /Paper presentation	✓ ✓	Writing farm experience paper Provide feed back	✓ ✓	Take part in writing farm management practices Farm experience presentation	✓	Develop confidence on farm management

4.2.assessment strategies and techniques and courses policy

Assessment

✓ Paper report.....	50%
✓ Oral examination.....	50%
✓ Total	100%

Courses policy

Student has to

- take all farm experience
- Take oral examination
- Respect all rules and regulation of the university

References

1. Pyne,WJA., 1990. An introduction to Animal Husbandry in the tropics. ELBS 4th edition. Longman Scientific and Technical.
2. Radostits OM 2001 Herd Health. Food Animal Production Medicine. 3rd Edition WB Saunders Company, Philadelphia USA Sainsbury D. and Sainsbury P. 1982 Livestock Health and Housing. Bailliere
3. Lewis, L.D., (1982). Feeding and care of the horse. Payne W.J.A., (1990). An Introduction to Animal Husbandry in the Tropics.
4. SastryN.S.R., Thomas C.K. & Singh R.A. (1986). Farm Animal Management and Poultry Production. 5th Ed.

Approval section

	Name	Signature
Chair holder		
Department head		

Experience in Veterinary Public Health



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Internship (General Veterinary Practice)				
Module No.	16				
Course Title	Experience in Veterinary Public Health				
Course code	Vtsc-4164				
Credit Hrs/ECTS	Cr Hrs=1	Lecture Hrs=0	Praactical=1	Home study=3	Cp/ECTS=2
Semester	II				
Year	IV				
Pre-requisites	None				
Target group	Bachelor of Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Practical Description

This field trip has food hygiene and principles of food preservation, meat hygiene, milk and milk hygiene parts will be visited.

Educational Field Trip: The visit will be offered through go in to slaughter houses/municipal abattoir and milk processing plants then learning by observing, following for guides of plant/instructor /laboratory assistances and practicing the activities done on the industries of animal origin food processing. Further reading assignments and short note provision of manuals will be delivered. Student progress will be assessed both in formative and summative and field visit report writing and presentation way of evaluation.

3. Objectives of the Educational Field Trip

At the end of the Educational Field Trip student should be able to:

- ☒ Clearly understand, analyze and apply the principles food hygiene and veterinary public health practices
- ☒ Design and implement an effective quality assurance practices

4. Educational Field Trip Components

4.1. Educational Field Trip ; Contents, Methods, Strategies, and Learning Outcome

No	Content and sub-content	methods, strategies	Student tasks	Learning outcome
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1	Hygiene in Meat and Meat processing technology	Visit and practice of: <ul style="list-style-type: none"> ✓ Pre-slaughter handling of slaughter animals ✓ Visit ante-mortem inspection ✓ Slaughtering and dressing operations ✓ Post-mortem meat inspection ✓ Hides and skin curing 	<ul style="list-style-type: none"> ✓ Following pre-briefings industries of animal origin food processing, and take notes ✓ Practicing ✓ Further reading manuals ✓ filed visit report writing and presentation 	<ul style="list-style-type: none"> ✓ Clearly understand, analyze and apply the principles meat hygiene ✓ Design and implement an effective quality assurance practices meat and meat products
2	Milk Hygiene	Visit and practice of: <ul style="list-style-type: none"> ✓ Methods used to assess the quality of milk ✓ Methods for determination of milk adulteration 	<ul style="list-style-type: none"> ✓ Following pre-briefings industries of animal origin food processing, and take notes ✓ Practicing ✓ Further reading manuals ✓ filed visit report writing and presentation 	<ul style="list-style-type: none"> ✓ Clearly understand, analyze and apply the principles milk hygien ✓ Design and implement an effective quality assurance practices milk and milk products

4.2. Assessment Strategies and Techniques and Courses Policy

Assessments

- ✓ Paper report..... 50%
- ✓ Oral examination..... 50%
- ✓ Total100%

Approval section

	Name	Signature
Chair holder		
Department head		

Animal Breeding and Genetics



BAHIR DAR UNIVERSITY
COLLEGE OF AGRICULTURE AND ENVIRONMENTAL SCIENCES
School of Animal Science and Veterinary Medicine

1. Course Information

Module Name	Animal Husbandry				
Module No	17				
Course Title	Animal Genetics and Breeding				
Course code	Anpt 2171				
Credit Hrs/ECTS	Cr Hrs =2	Leacture Hrs=1	Practical =1	Home study =4	Cp/ECTS=3
Semester	I				
Year	II				
Pre – requests	None				
Target group	Bachelor of Veterinary Science				
Status of the course	Compulsory				
Instructor name & address					

2. Course Description

The courses consist of Classification of Genetics, Description of cytogenesis (cells and cell division), Mendelian genetics and its extension, variations and measures of variation, principles of population genetics (Gene and genotypic frequencies, Hardy-Weinberg law and factors affecting gene and genotypic frequencies), Breeds of livestock and major traits in farm animals. Genetic parameters: heritability, repeatability, and correlation among traits. Principles and methods of selection (Selection based on records of individuals, progeny, pedigree, collateral relatives and combination of records simple selection indices). Conservation of farm animal resources.

3. Course Objectives:

At the end of the course, the student will be able to:

- To be familiarize with the historical development of genetics and its classification
- To describe the nature of cell, cell structure and function, and cell division
- To explain the principles of Mendelian Genetics and its extensions
- To describe how variation is formed in farm animals
- To understand the gene and gene frequencies and the principle of Hardy-Weinberg equilibrium
- Identify and characterize the different breeds of livestock breeds
- Understand how to estimate genetic parameters
- Understand the principles, types and methods of selection
- Identify methods of animal genetic conservation

4. Syllabous components

4.1. Course contents, methods, strategies and learning outcome

Weeks	Contents and sub-contents	Methods, strategies	Students tasks	Learning out come
1	Chapter 1: Introduction (2 hrs) 1.1 Terminologies 1.2 Historical Prospective of Genetics 1.3 Classification of Genetics	Introduce animal breeding and genetics	✓ Listen the lecture and take notes ✓ Forwards all the confusion /doubts	Develop postive attitude to the course List, know and describe gloserry terms, hisory and types of genetics
2-3	Chapter 2: Cytogenesis (6 hrs) 2.1 Cell 2.2 Chromosomes 2.3 Cell division 2.4 Gametogenesis	Lecture on type of cell, function of chromosome, types of cell division, and division of gamets Brainstorming Providing lecture note Group assignment	Listen the lecture and take notes Attend all lectures and actively participate in class discussions Meet all announced deadlines for assignments Forwards all the confusion /doubts	Understand and describe cell and gamet division

4	<p>Chapter 3: Mendelian Genetics and Its Extension (3hrs)</p> <p>3.1 Historical perspective</p> <p>3.2 Factors of inheritance in Mendelian experiment</p> <p>3.3 Beyond Mendelian Genetics: Extension of Mendelian law</p>	<p>Lecture on Historical perspective of Mendelian Genetics, factors of inheritance and Mendelian laws</p> <p>Brainstorming</p> <p>Providing lecture note</p>	<p>Listen the lecture and take notes</p> <p>Attend all lectures and actively participate in class discussions</p> <p>Forwards all the confusion /doubts</p>	<p>Know and understand mendelian genetics, list inheritance factors and Menedel first and second laws</p>
5	<p>Chapter 4: Variation In Farm Animals(3hrs)</p> <p>4.1 Introductions</p> <p>4.2 Components of variation</p> <p>4.2.1 Genetic variation</p> <p>4.2.2 Environmental Variation</p> <p>4.2.3 Genetic and environmental interaction and correlation</p>	<p>Introduce farm animals variations</p> <p>Lecture on components of variations</p> <p>Providing handout</p>	<p>Listen the lecture and take notes</p> <p>Attend all lectures and actively participate in class discussions</p> <p>Forwards all the confusion /doubts</p>	<p>Understand and describe components of variations</p> <p>To under and identify the tools available to maximize the response to genetic selection in a variety of animal species</p>
6-7	<p>Chapter 5: Population Genetics (6hrs)</p> <p>5.1 Introduction</p> <p>5.2 Gene and genotypic frequencies</p> <p>5.2.1 Genotypic frequency</p> <p>5.2.2 Gene frequencies</p> <p>5.3 Hardy-Weinberg Equilibrium</p> <p>5.3.1 Hardy-Weinberg law</p> <p>5.3.2 Application of Hardy-Weinberg law</p> <p>5.3.3 Factors affecting Hardy-Weinberg frequencies</p>	<p>Introduce population genetics</p> <p>Lecture on gene and genotype frequency, Hardy Weinberg Equilibrium law and its application</p> <p>Reading assignment and home work</p> <p>Providing handout</p>	<p>Listen the lecture and take notes</p> <p>Attend all lectures and actively participate in class discussions</p> <p>Forwards all the confusion /doubts</p>	<p>Understand and know gene, genotype and phenotype frequency</p> <p>Understand HWE and Hardey-Weinberg law and its application and factors affecting Harde-Weinberg frequency</p>

8-9	<p>Chapter 6: Breeds of Livestock and Their Major Traits (3hrs)</p> <p>6.1 Breeds of livestock</p> <p>6.1.1 Livestock breeds in the world and their characteristics</p> <p>6.1.2 Ethiopian livestock breeds Characteristics</p> <p>6.2 Major traits of farm animals</p>	<p>Lecture on local and exotic livestock breeds and their characteristics</p> <p>Lecture on major traits of farm animals</p> <p>Peer discussion</p> <p>Providing lecture notes</p>	<p>Listen the lecture and take notes</p> <p>Attend all lectures and actively participate in class discussions</p> <p>Forwards all the confusion /doubts</p>	<p>Describe and understand local and exotic livestock breeds</p> <p>Understand major traits of farm animals</p> <p>To be able to assess animal physical structure and make selection decisions based on that structure</p>
10-11	<p>Chapter 7: Estimation of Genetic Parameters (6hrs)</p> <p>7.1 Heritability</p> <p>7.2 Repeatability</p> <p>7.3 Genetic and environmental correlation</p> <p>7.4 Breeding value and transmitting ability</p> <p>7.5 Genetic gain or selection response</p> <p>7.6 Heterosis or Hybrid Vigor</p>	<p>Introduce genetic parameters</p> <p>Lecture on genetic parameters</p> <p>Class work and group individual assignment</p> <p>Providing lecture notes</p>	<p>Listen the lecture and take notes</p> <p>Attend all lectures and actively participate in class discussions</p> <p>Work the given assignment</p> <p>Forwards all the confusion /doubts</p>	<p>Understand and describe genetic parameters (heritability, repeatability, correlation, BV, TA, GG/SR and heterosis)</p>
12	<p>Chapter 8: Selection (3hrs)</p> <p>8.1 Types of selection</p> <p>8.2 Factors affecting the selection progress</p> <p>8.3 Methods of selection</p>	<p>Lecture on type and methods of selection and factors affecting selection</p> <p>Provide lecture notes</p>	<p>Listen the lecture and take notes</p> <p>Attend all lectures and actively participate in class discussions</p>	<p>List and understand type and methods of selection</p>
13-14	<p>Chapter 9: Types of Mating Systems in Farm Animals (6hrs)</p>	<p>Lecture on inbreeding, out-breeding random and non</p>	<p>Listen the lecture and take notes</p> <p>Attend all lectures</p>	<p>Understand and know types of mating systems (inbreeding, out breeding)</p>

	9.1 Inbreeding 9.2 Out Breeding 9.3 Random and non-random mating 9.4 Some other terminologies used in mating systems	random matings Provide lecture notes	and actively participate in class discussions Forwards all the confusion /doubts	random and non random mating) To understand inbreeding and crossbreeding effects related to production and conservation of species
15	Chapter 10. Animal Genetic Resources Conservation(3hrs) 10.1 Introduction 10.2 Importance of animal genetic resources conservation 10.3 Methods of conservation	Lecture on introduction, importance of genetic conservation and methods of genetic resource conservation	Listen the lecture and take notes Attend all lectures and actively participate in class discussions Forwards all the confusion /doubts	Understand importance of animal genetic resource conservation and know methods of conservation
16	Final exam			

4.2. Assessment strategies and techniques and courses policy

Assessment

✓	Quiz	7%
✓	Test.....	8%
✓	Assignment.....	10%
✓	Mid exam.....	25%
✓	Final exam.....	50%
✓	Total	100%

Courses policy

Student has to

- ✓ Attend 85% of the class take all continuous assessment and mid exam
- ✓ Take final exam
- ✓ Respect all rules and regulation of the university

Reference

1. Adrian M. Srb, Ray D. Owen and Robert S. Edgar (1965). General genetics. Second Edition. W.H Freeman and company San Francisco.
2. Berhanu Belay (2002). Principles and practices of Animal breeding. A text book for the course animal

breeding. Jimma college of Agriculture.

3. Benjamin Lewin (2001). Genes VII. Oxford university press.
4. Daniel L. Hart and Andrew, G. Clark .1997. Principles of Population Genetics.3rd edition
5. Gardner, E.J., Snustad, D.P. and Simmons, M.J. (1991): Principles of Genetics. 8thed.
6. ILCA. 1992. African Animal Genetic Resources. Proceeding of the Research planning workshop held at ILCA. Addis Ababa 19-21 Feb. 1992.
7. Gardner, E.J Simmon M.J., and snurstad D.p. (2002). Principles of genetics. Jhon. Willey and sons INC. New York.
8. Griffiths A.J.F, Gelbart, W.M., Miller, J.H and lewontin R.C (1999). Modern Genetic Analyses; Freeman and company
9. Falconer, D.s. (1989). Introduction to quantitative Genetics. Longman Scientific and technical. New York.
10. Malcolm, B. W. (1991) Dalton's Introduction to Practical Animal Breeding
11. Michael L. and Bruce W. (1998) Genetics and Analysis of Quantitative Traits
12. Monroe W. Strickberger (2001). Genetics. Third edition. Prentice. Hall of India. Private limited. New Delhi.
13. Nicholas, F.W. (1996). Introduction to veterinary Genetics. Oxford University Press.
14. Klug W. S, and Cummings M.R. (1985). Concepts of Genetics. Charles E. Merrill Publishing Company. Columbus.
15. Prichner F. (1969). Population genetics in Animal breeding. S Chand and Company LMD. Ram Nagar. New delhi.
16. Robert H. Temarin. (1993) Principle of genetics. 4th edition
17. Van Vleck, L.D.; E.J, Pollak and E.A.B. Oltenacu (1987) Genetics for the animal science
18. Genetics for a new generation: <http://www.ansci.cornell.edu/usdagen/usdamain.html>
19. Introductory animal genetics: <http://www.ansci.cornell.edu/courses/as221/index.html> What's a genome: http://www.genomenewsnetwork.org/resources/whats_a_genome/

Approval section

	Name	Signature
Chair holder		
Department head		

Small ruminant and swine production



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Animal Husbandry
Module No.	17
Course Title	Small ruminant and swine production
Course code	Anpt-2172
Credit Hrs/ECTS	Cr Hrs=3 Lecture Hrs=2 practical=1 Home study=7 Cp/ECTS=5
Semester	I
Year	II
Pre-requisites	None
Target group	Bachelor Veterinary Science
Status	Compulsory
Instructor name and address	

2. Course description

Lecture :-The course deals origin and domestication of small ruminant with distribution ,taxonomic classification, and socio economic importance of sheep and goats with emphasis on the Ethiopian situation; production systems (status, constraints and future trend) of sheep and goat production in Ethiopia. Topics on recognized breeds of sheep and goats; basic concepts in feeding management, housing, health care; reproduction and breeding of sheep and goats; management practices that contribute towards improvement of the health state and productivity of small ruminants; handling, grading, processing and marketing of the products of sheep and goats are also addressed

Practical: Identification of materials and equipments for sheep and goats farm, Identify the feeds and prepare supplementary feeds, Phenotypic characterizations and its measurements , practicing Docking, estimation of age of sheep and goats by dentition, Estimation of weight using linear measurements, Hoof trimming, Wool shearing

3. Course objectives

At the end of this course, students should be able to:

- ✓ Will have knowledge of management techniques in feeding, housing, breeding, reproduction and disease control of sheep and goats
- ✓ Describe and apply the knowledge gained in handling, grading and processing of sheep and goats products.

4. Syllabus Components

4.1. Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1,2	<p>Chapter 1:General Introduction</p> <p>1.1. definition of common terminologies</p> <p>1.2. Origin and domestication of sheep and goat.</p> <p>1.3. Features differentiating sheep and goat</p> <p>1.4. Taxonomy classification of sheep and goat</p> <p>1.5. Role of raising sheep and goat production system</p> <p>1.6. Sheep and goat production system</p> <p>1.7. constraints for sheep and goat production</p>	<p>Define important terminologies in sheep and goat</p> <p>Lecture on origin and domestication, taxonomy classification, Providing short note on production system</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p>	<p>✓ Understand sheep and goat origin and domestication</p> <p>✓ Describe production system</p>
3,4	<p>Chapter 2.Breeds and Breeding of sheep and goat</p> <p>3.1. Breeds of Sheep and Goat</p> <p>Population and distribution of Ethiopian Sheep and Goats</p> <p>Ethiopian Sheep and Goat Breeds and their Characteristics</p> <p>Exotic Breed of Sheep and Goat Imported in Ethiopia</p> <p>3.2. Breeding</p> <p>Basic Concepts in Breeding</p> <p>Breeding Objectives</p> <p>Breeding Systems</p> <p>3.3. Concepts in Breed Selection</p> <p>Selection of Breeding Sheep and goat</p> <p>Aids to Selection</p> <p>Methods of selection</p>	<p>✓ Lecture on important sheep and goat breeds (exogenous and indigenous), Providing short note on each breeds with their characteristics</p> <p>✓ Lecture on methods of selection</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Take part on reading assignment</p>	<p>✓ Describe potential sheep and goat breeds and their characteristics</p> <p>✓ Explain selection methods</p>

5,6	<p>Chapter3:Reproductn in Sheep and Goats</p> <p>3.1. Definition and Importance of Reproduction</p> <p>3.2. Reproductive Organs and their Major Functions</p> <p>3.3. Reproductive Performance</p> <ul style="list-style-type: none"> • Puberty and Sexual Maturity • Age at First Mating • Estrus Cycle in Ewes and Does • Heat Detection and Mating Management • Gestation • Parturition <p>3.4. Reproductive Biotechnology</p> <p>Artificial Insemination (AI)</p> <p>3.5. Embryo Transfer (ET)</p>	<p>✓ Brainstorming</p> <p>✓ Lecture on reproductive organs of male and female,</p> <p>✓ Providing short note</p> <p>✓ Lecture on reproductive performance measurement</p> <p>✓ Providing short note</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion</p> <p>✓ Ask and answering</p>	<p>✓ Understand the reproductive organ and their function</p> <p>✓ Describe the reproductive performance measurement</p>
7	<p>Chapter 4:Feeding Housing of Sheep and Goats</p> <p>4.1. Feeding Habits of Sheep and Goats and Voluntary Feed Intake</p> <p>4.2. Digestive System Structure of the Ruminant Stomach Rumen Environment and its Manipulation</p> <p>4.3. Feedstuffs and Nutrients Feedstuffs Nutrients requirement of sheep and goats</p>	<p>✓ Lecture on Feeding behavior, digestive system, nutrient requirement of sheep and goat</p> <p>✓ Providing short note</p> <p>✓ lecture on housing types of sheep and goat</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion</p> <p>✓ Take reading assignment</p>	<p>✓ Understand feeding ,digestive system of sheep and goat</p>

	4.4. Improved Feeding Strategies of Sheep and Goats 4.5. Housing Site Selection for Sheep and Goats Farm Housing of Sheep and Goats			
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8	<p>Chapter5:Production and Body Condition Scoring of Sheep and Goats</p> <p>5.1. Meat Production of Sheep and Goats 5.2. Milk Production of Sheep and Goats 5.3. Skins and Pelts Production of Sheep and Goats 5.4. Wool/hair Production of Sheep and Goats 5.5. Body condition scoring</p>	<ul style="list-style-type: none"> ✓ Lecture sheep and goat products ✓ Provide short note ✓ Discussion 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Able to know products and by products of sheep and goat
9	<p>Chapter 6:Diseases of sheep and goat</p> <p>6.1. Common Diseases of Sheep and Goat 6.2. Disease control, prevention and monitoring 6.3. Parasites of sheep and goat 6.4. Prevention and Control of Internal/External Parasites</p>	<ul style="list-style-type: none"> ✓ Lecture on major diseases, parasites ,prevention control methods ✓ Provide short note on data presentation 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Identify common diseases and parasites /external or internal
10	<p>Chapter 7:Records and Record Keeping</p> <p>7.1. Importance of Record Keeping 7.2. Types of Records</p>	<ul style="list-style-type: none"> ✓ Lecture on the importance and types of record ✓ Pear idea sharing 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Describe the types of records

Mid Exam		
4.2.assessment strategies and techniques and courses policy		
Assessment		
	➤ Quiz	7%
	➤ Test.....	8%
	➤ Assignment.....	10%
	➤ Mid exam.....	25%
	➤ Final exam.....	50%
	➤ Total	100%
Courses policy		
Student has to		
	➤ Attend 85% of the class	
	➤ take all continuous assessment and mid exam	
	➤ Take final exam	
	➤ Respect all rules and regulation of the university	
References		
1. Ruth, M. Gaten (1991). The Tropical Agriculturalist, CTA, Macmillan, Education		
2. Deven And McLeroy, G.B. (1982). Goat and sheep production in the Tropics. Longman Singapors Publishers Pvt. Ltd.		
3. Belshner, H.G. (1971). Sheep and diseases. 9th Ed. Angus and Roberston Publishers.		
4. Fell, H.R. (1985). Intensive sheep management. 2nd ed., farming press limited		
5. Oun, J.B. (1976). Sheep production. Billiere Tindal.		
6. Gall, C. (editor) (1981). Goat production. Academic Press		
7. Hetherington, L. (1979). All about goats. 2nd edition. Farming press limited.		
Proposed practical activity		
✓	Identification of materials and equipments for sheep and goats farm,	
✓	Identify the feeds and prepare supplementary feeds,	
✓	Phenotypic characterizations and its measurements , practicing Docking, estimation of age of sheep and goats by dentition, Estimation of weight using linear measurements, Hoof trimming, Wool shearing	
Approval section		
	Name	Signature
Chair holder		
Department head		

Animal feeds and nutrition



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Animal Husbandry				
Module No.	17				
Course Title	Animal feeds and nutrition				
Course code	Anpt-2173				
Credit Hrs/ECTS	Cr Hrs=2	Lecture Hrs=1	Practical=1	Home study=4	Cp/ECTS=3
Semester	II				
Year	II				
Pre-requisites	None				
Target group	Bachelor Veterinary Science				
Status of the course	Compulsory				
Instructor name and address					

2. Course Description

Applied animal nutrition starts by defining some common terms &/or quantities, characterization of feedstuffs. It goes on dealing with feed storage methods, feed treatment methods, feed processing method, minerals and mineral block making, and ration formulation systems and feeding for farm animals.

Lectures: The course deals with the general proper utilization livestock feed resources that are locally available starting from low nutritive value feed (roughage) by applying different feed treatment methods means increasing its nutritive value ,making least cost ration formulation up to higher nutritive value of feeds(nutrient rich feed like concentrate feed improved forage) to achieve the nutritional requirement of the livestock and to increase their productivity interms of meat ,milk egg and also their by products like hid and skin, wool etc.

Practical: Practice making hay and prepare proper storage to prevent feed wastage ,nutrient loss and attacked by different insects or rodent. Practice assessment of hay quality in the field & laboratory

Exercise physically feed treatment methods in the field using sickle, chopper for proper utilization of feed resources. Formulate least cost rations from locally available feed resources for different farm animals using by

hand

3.Objectives of the Courses

At the end of the course student should able to:

- ✓ identify, characterize and name locally available feed resources
- ✓ justify the need for feed conservation and describe the different feed conservation methods
- ✓ justify the importance of feed treatment, describe different feed treatment methods and properly treat feeds using applicable treatment methods
- ✓ Formulate least cost rations from locally available feed resources for different farm animals kept for optimum production.
- ✓ Discuss the interaction between nutrition and health and describe metabolic disorders of importance in the tropics

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	Methods/ Pedagogical approaches	Student asks Activities/	Learning out come
1-3	<p>Chapter 1:General Introduction(2 hours)</p> <p>1.1. Discuss the demand for food and livestock products and by-products</p> <p>1.2 .The contribution of livestock sector in Ethiopia</p> <p>1.3. Locally available livestock feeds and feeding practices in Ethiopia</p> <p>1.4. feed additives and their role in animal production with emphasis on the tropics</p>	<p>Lecture, small group discussion, questioning and answering</p> <p>✓ Lecture ; Reading assignment</p>	<p>✓ Listen to a lecture and take notes on the lesson treated, forward all the confusion or doubts students may have in relation to the given lecture, take part in discussions, read privately on the terminologies</p> <p>✓ Students must read about the topic (relevant to Ethiopia); Listen to a lecture, and take notes on the lesson treated, forward all the confusion or doubts students may have in relation to the given lecture, take part</p>	<p>✓ To identify the important feed component for livestock production</p> <p>✓ To understand the major cost of livestock production</p> <p>✓ To identify the main contribution of livestock sector in Ethiopia with related to their products</p>

			in discussions for the assignment.	
4-6	<p>Chapter 2: Feed conservation methods (5 hours)</p> <p>2.1 .Seasonal fluctuations in feed availability and quality under different agro-ecologies the need for feed conservation</p> <p>2.2. Hay making Principles of hay making Factors which affects quality of hay</p> <p>2.3. Hay quality parameters hay quality assessment methods</p> <p>2.4. In-field-standing hay Principles of standing hay making and make comparison with conventional hay</p> <p>2.5. silage making Principles of silage making steps of silage making</p> <p>2.6. Silage quality parameters silage quality assessment factors which affect silage quality economics of whole crop silage Vs crop residues</p>	<p>✓ Reading different books, Handouts, Manual</p> <p>✓ Brainstorming</p> <p>✓ Assignment; group work and presentation</p> <p>✓ Demonstrate practical work and write report what they are understand from the result</p>	<p>✓ Listen the lecture and take important short notes from the lecture</p> <p>✓ Attend lecture and Practical/ laboratory class then ask the question if there is any unclear idea</p> <p>✓ Discuss with their classmate then reflect their idea in the whole class.</p> <p>✓ Take part in reading assignment; group work and presentation</p>	<p>✓ Understand the impacts of Seasonal fluctuations feed availability in Ethiopia</p> <p>✓ To identify Hay making Principles</p> <p>✓ Describe different factors that affect hay quality parameters</p> <p>✓ Identify silage making Principles following in their proper steps.</p> <p>✓ Differentiate the importance/ Purpose of hay and silage making buy using locally available feed resources</p> <p>✓ Understand and practice silage and hay making practically.</p>

7-9	<p>Chapter 3: Feed treatment methods (5 hours)</p> <p>3.1. The need for feed treatment</p> <p>Leaf anatomy of C₃ and C₄ plants</p> <p>factors for change/variation in chemical composition</p> <p>3.2. Feed treatment methods</p> <p>3.3. Chemical treatment</p> <p>3.4. Physical treatment</p> <p>3.5. Biological treatment</p>	<p>✓ Lecture on different methods of feed treatment</p> <p>✓ Brainstorming</p> <p>✓ Reading from various sources</p> <p>✓ Group and individual assignment</p> <p>✓ Reading assignment, excursion, group presentation and practical on feed physical treatment, Chemical treatment and Biological treatment</p>	<p>✓ Listen to a lecture and take notes on the lesson treated, forward all the confusion or doubts students may have in lecture, reading assignment and presentation</p> <p>✓ Group discussion and reflection</p> <p>✓ Reading assignment; presentation & excursion.</p> <p>✓ Practical work on feed physical treatment</p> <p>✓ practical work on feed chemical treatment</p>	<p>✓ students are acquainted with the different feedstuffs and storage and treatment methods for the efficient utilization of feed resources</p> <p>✓ Understand the different methods of feed treatment</p> <p>✓ justify the merits of feed treatment</p> <p>✓ Identify the difference between feed conservation and feed treatment</p> <p>✓ Develop the feed treatment skill</p>
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<p>10-13</p>	<p>Chapter 4: Ration formulation 4.1. The need for ration formulation 4.2. Determining the nutrient requirement of farm animals (concept) 4.3. Ration formulation systems for non-ruminants and ruminants 4.4. Ration formulation systems for sheep 4.5. Ration formulation systems for goat 4.6. Ration formulation systems for cattle 4.7. Strategic feeding of farm animals (concepts) 4.8. estimating available feed resources & feed requirements for animals</p>	<p>✓ Lecture ✓ Reading individual/group assignment then reflection ✓ workout/hand calculation practices ✓ Providing short note from the lecture</p>	<p>✓ Listen to a lecture and take notes, ✓ taking reading assignment, and hand calculation; ✓ practical on least cost ration formulation for poultry ✓ Pear idea sharing</p>	<p>✓ Understand the concepts of least cost ration formulation for different livestock ✓ Identify different feed ingredient for ration formulation ✓ Understand the nutritional requirement of farm animals ✓ Develop practical skills about ration formulation either by hand or software ✓ practical on feeding and checking the formulated feeds (at least the palatability) for farm animals</p>
<p>14-16</p>	<p>4.9. matching livestock production with locally available feeds 4.10. Feeding practices and checking rations</p>			

15,1 6	Chapter5: The interaction between nutrition and health -metabolic disorders 5.1. Interaction between nutrition and health 5.2. Anti nutritional factors causes toxic and metabolic disorder	✓ Lecture ✓ reading assignment, group presentation ✓ small group discussion then reflection ✓ Provide short note ✓ Class work ✓ Asking question and answering	✓ Listen to a lecture, and take notes on the lesson treated ✓ Forward all the confusion or doubts students may have in relation to the given lecture ✓ Take reading assignment and presentation	✓ Know the ship between nutrition and metabolic disorder ✓ Identify some metabolic disorder caused by nutrition ✓ Understand the prevention and treatment methods of these metabolic disorder ✓ Describe antinutritional factors and their impacts on farm animals with related to feeds and nutrition
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Final exam

4.2.assessment strategies and techniques and courses policy

Assessment

- ✓ Quiz7%
- ✓ Test.....8%
- ✓ Assignment.....10%
- ✓ Mid exam.....25%
- ✓ Final exam.....50%
- ✓ Total100%

Courses policy

Student has to

- ✓ Attend 85% of the class
- ✓ take all continuous assessment and mid exam
- ✓ Take final exam
- ✓ Respect all rules and regulation of the university

References Materials

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Proposed practical activity

- ✓ Practice making hay and prepare proper
- ✓ Practice assessment of hay quality in the field & laboratory
- ✓ Exercise physically feed treatment methods in the field using sickle, chopper for proper utilization of feed resources.
- ✓ Formulate least cost rations from locally available feed resources for different farm animals using by hand

Approval section

	Name	Signature
Name Instructor		
Chair holder		
Department head		

Dairy and Beef cattle production



BAHIR DAR UNIVERSITY
COLLEGE OF AGRICULTURE AND ENVIRONMENTAL SCIENCES
 School of animal science and veterinary medicine

1. Course Information

Module Name	Animal Husbandry			
Module No.	17			
Course Title	Dairy and beef cattle production			
Course code	Anpt-2174			
Credit Hrs/ECTS	Cr Hrs=2	Lecture Hrs=1	Practical=1	Home study=4 Cp/ECTS=3
Semester	II			
Year	II			
Pre-requisites	None			
Target group	Bachelor Veterinary Science			
Status	Compulsory			
Instructor name and address				

2. Course Description

Lectures : The course dairy and beef cattle production include Historical dairy development, socioeconomic importance of dairy cattle; characterization of dairy production system existed in Ethiopia; breeds of dairy cattle (indigenous and exotic); feeds, feeding and housing of, Reproductive management of dairy cattle; major diseases (control and prevention); lactation physiology and management; milk quality evaluation; handling, processing and marketing of dairy products and record keeping

The course topics of beef include Historical development of beef industry in Tropics and in Ethiopia, recognized breeds of beef cattle (indigenous and exotic); feeding, breeding, ; economically significant feedlot diseases(control and prevention); carcass quality evaluation; handling, processing and marketing of beef and record keeping

Practical Demonstration of dairy house (farm design, calf pen, maternity room, isolation room, milk parlor), milking utensil and equipment, practicing proper milking procedure, ration formulation and feeding
 The course topics covers practical aspect of identification methods, estimation of age by dentation, weight estimation using girth meter, physical conformation of beef cattle and body condition scoring and evaluation of carcass

3. Objectives of the Courses

At the end of the course student should able to:

Describe the development of dairy industry in the tropics and in Ethiopia and role of dairy farming
 Describe dairy production system, recognized breeds (indigenous/exotic) and breeding methods

<p>Explain about feeds, feeding, housing, management and health care of dairy cattle. Explain milk quality evaluation and factors influencing milk production</p> <p>Describe the development of beef industry in the tropics and in Ethiopia Explain about beef breeds and breeding, feeds and feeding and economically significant feedlot diseases Explain carcass composition, quality evaluation, muscle structure</p>				
4.Syllabous Components				
4.1.Course Contents, Methods, Strategies, and Learning Outcome				
Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1,2	<p>Chapter 1: Introduction</p> <p>1.1.Terminologies 1.2.Historical development of dairy sector 1.3.dairy sector in the tropics and in Ethiopia 1.4. Role of dairy sectors</p>	<p>✓ Define Terminologies</p> <p>Introduce about</p> <p>✓ Dairy industry development Providing short note on role of dairy sector</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p>	<p>✓ Knows new words in dairy</p> <p>✓ Understand dairy development in world and Ethiopia context</p> <p>✓ Explain socioeconomic role of dairy farming</p>
3,4	<p>Chapter 2: dairy production system in Ethiopia</p> <p>3.4. Pastoral and Agro pastoral production system 3.5. Highland smallholder milk production system 3.6. Urban and peri-urban milk production system 3.7. Intensive milk production system</p>	<p>✓ Brainstorming</p> <p>✓ Lecture on types dairy production system in Ethiopia</p> <p>✓ Provide short note</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p>	<p>✓ Describe different types of dairy production system</p>

6	<p>Chapter 3:Breeds and Breeding of dairy cattle</p> <p>5.1. Local/indigenous dairy cattle breeds</p> <p>5.2. Exotic dairy cattle breeds</p> <p>5.3. Crossbreed dairy cattle breeds</p> <p>5.4.Dairy cattle breeding programs,</p> <p>5.5. selection principles</p> <p>5.6. mating systems</p>	<p>✓ Introduce potential dairy breeds</p> <p>✓ Lecture on local/exotic dairy breeds</p> <p>✓ Providing short note on breeds characteristics</p> <p>✓ Short note on selection principle and mating system</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Pear idea sharing</p> <p>✓ Ask and answer question</p>	<p>✓ Understand local and exotic dairy breeds</p> <p>✓ Describe selection technique and mating system</p>
7,8	<p>Chapter 4:Feed, Feeding and housing of dairy cattle</p> <p>4.6. Farm site selection</p> <p>4.7. Types of dairy houses and space requirement</p> <p>4.8. Arrangement of dairy houses</p> <p>5.1. feed resource of dairy cattle</p> <p>5.2. Ration formulation</p> <p>5.3.feeding young herd</p> <p>5.4.feeding lactating cows</p> <p>5.5.feeding dry cows</p>	<p>✓ Brainstorming</p> <p>✓ Lecture feed resource,feeding of herdsand providing short note</p> <p>✓ Lecture on criteria for dairy farm site selection, and space requirement</p> <p>✓ Providing short note on house arrangement</p> <p>✓ Class work on ration formulation</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion</p> <p>✓ Take reading assignment</p> <p>✓ Pear idea sharing</p>	<p>✓ Understand the major dairy cattle feed resource, feeding strategies</p> <p>✓ Explain the criteria for dairy farm site selection</p> <p>✓ Knows dairy house types and space requirement for each animal</p> <p>✓ Have concept about ration formulation</p>

9	Chapter6: Health management in dairy cattle 6.1. Metabolic disease 6.2. Reproductive diseases 6.3. Diseases of Udder	<ul style="list-style-type: none"> ✓ Lecture on Metabolic, reproductive and udder disease ✓ Provide short note 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Class discussion 	<ul style="list-style-type: none"> ✓ Understand most dairy cattle diseases which hide the productivity
10	Chapter 7: Reproductive management of dairy animals 7.1. Heat detection 7.2 Artificial Insemination 7.3 pregnancy diagnosis and care during pregnancy 7.4 parturition and neonatal care	<ul style="list-style-type: none"> ✓ Brainstorming ✓ Lecture on heat detection technique, Artificial Insemination, Pregnancy diagnosis methods and providing short note 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Take reading assignment 	<ul style="list-style-type: none"> ✓ Understand heat detection technique ✓ Able to know AI with its advantage and disadvantage ✓ Able to know pregnancy diagnosis methods ✓ Understand the stage of parturition and neonatal care
11	Chapter 8: Milking and milk handling 8.1. anatomy of the udder,	<ul style="list-style-type: none"> ✓ Lecture on anatomy of udder with 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture 	<ul style="list-style-type: none"> ✓ Describe the anatomy of udder
11	Chapter 9. Record keeping in dairy farms 9.1. Importance of keeping record 9.2. Types of dairy farm records	<ul style="list-style-type: none"> ✓ Lecture on record keeping and types of records ✓ Providing short note 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture 	<ul style="list-style-type: none"> ✓ Describe the importance of record keeping ✓ Explain types of dairy farm records

<p>12</p>	<p>Chapter 10: General aspects of the beef industry</p> <p>10.1. Generalities on Beef industry</p> <p>10.2. Beef production systems in the tropics</p> <p>10.2.1. Beef production in the tropics</p> <p>10.2.2. Beef production in Ethiopia</p>	<p>✓ Introduction on beef industry</p> <p>✓ Lecture on different types beef production in Tropics and Ethiopia</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all doubts in relation to the given lecture</p> <p>✓ Group discussion and classwork</p>	<p>✓ Understand about Beef industry development</p>
<p>13</p>	<p>Chapter 11. Beef Cattle Breeds and Breeding</p> <p>11.1. Recognized breeds of beef cattle(indigenous and exotic) in Ethiopia</p> <p>11.2. Breeding methods</p> <p>11.3. Traits of beef cattle</p> <p>11.4. Genetic improvement of beef cattle</p>	<p>✓ Lecture on different types beef breeds and important traits for beef cattle selection</p> <p>✓ Lecture on genetic improvement methods of beef cattle</p> <p>✓ Providing short note</p>	<p>✓ Listen lecture and take notes from the lecture</p> <p>✓ Forward all doubts relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion and classwork</p>	<p>✓ Identify the potential local/exotic beef breed</p> <p>✓ Understand the important traits in beef cattle</p> <p>✓ Describe about genetic improvement methods in beef cattle</p>

14	<p>Chapter 12. Feeds and Feeding beef cattle</p> <p>11.1.Nutrient requirement</p> <p>11.2.Feed stuffs and ration formulation for different classes of beef animals</p> <p>11.3. purchasing animals for Fattening and fattening principle</p> <p>11.5.Length of feeding period</p> <p>11.6. Facilities and equipment for fattening</p> <p>11.6.Health problems</p> <p>11.6.1.Economically significant feedlot diseases,</p> <p>11.6.2.Control and prevention</p>	<p>✓ Brainstorming</p> <p>✓</p> <p>✓ Lecture on different types feed resource, nutrient requirement for each animals, ration formulation, facilities for fattening</p> <p>✓ Provide short note</p> <p>✓ Lecture on major feedlot diseases, prevention and control</p>	<p>✓ Listen lecture</p> <p>✓ and take notes from the lecture</p> <p>✓ Forward all doubts relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion and classwork</p>	<p>✓ Understand about ration formulation for beef cattle with the important ingredient</p> <p>✓ Describe the fattening systems</p> <p>✓ Understand the important facilities and equipment for fattening</p> <p>✓ Identify major feedlot diseases, control and prevention</p>
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15	Chapter13.Transportation and Marketing of beef cattle 12.1.Handling, 12.2.Grades of carcass of beef, 12.3.Qualitygrades, and Quality assurance 12.4. Processing and marketing of beef	✓ Lecture on handling of beef cattle, ✓ Class discussion on grades of carcass and processing ✓ Provide short note	✓ Listen lecture and take notes from the lecture ✓ Forward all doubts relation to the given lecture ✓ Take reading assignment	✓ Understand beef quality grades
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16	Chapter 14.Records 13.1. Production and financial records Final exam
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4.2.assessment strategies and techniques and courses policy

Assessment	
✓	Quiz7%
✓	Test.....8%
✓	Assignment.....10%
✓	Mid exam.....25%
✓	Final exam.....50%
✓	Total100%

Courses policy	
Student has to	
✓	Attend 85% of the class
✓	take all continuous assessment and mid exam
✓	Take final exam
✓	Respect all rules and regulation of the university

References	
1.	Payne WJA 1990 An Introduction to Animal Husbandry in the Tropics. ELBS 4 th Edition. Longman Scientific and Technical.
2.	Radostits OM and Blood DC 1985 Herd health: A text book of health and production management of agricultural animals. WB Saunders Company, PhiladelphiaUSA.

3. Radostits OM 2001 Herd Health. Food Animal Production Medicine. 3rd Edition
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4. Sainsbury D. and Sainsbury P. 1982 Livestock HealthandHousing.Bailliere
5. Ken, H., and Tony, P., 1991. Feedlotting a guide for beef producers. Beef cattle
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6. Jarrige, R and C. Beranger (eds.) (1992). Beef Cattle Production, World
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7. Payne WJA 1990 An Introduction to Animal Husbandry in the Tropics. ELBS
4th Edition. Longman Scientific andTechnical.
8. Radostits OM and Blood DC 1985 Herd health: A text book of health and
production management of agricultural animals. WB Saunders Company,
PhiladelphiaUSA.
9. Radostits OM 2001 Herd Health. Food Animal Production Medicine. 3rd
Edition WB Saunders Company, PhiladelphiaUSA
10. Sainsbury D. and Sainsbury P. 1982 Livestock Health and Housing.
BailliereTindall, London.

Proposed practical activity

- ✓ Demonstration of dairy house (farm design, calf pen, maternityroom, isolation room, milk parlor),milking utensil and equipment, practicing proper milking procedure ,ration formulation and feeding

Approval section

	Name	Signature
Chair holder		
Department head		

Working animal management



BAHIR DAR UNIVERSITY
COLLEGE OF AGRICULTURE AND ENVIRONMENTAL SCIENCES
School of animal science and veterinary medicine

1. Course Information

Module Name	Animal Husbandry				
Module No.	17				
Course Title	Working animal management				
Course code	Anpt-2175				
Credit Hrs/ECTS	Cr Hrs=2	Lecture Hrs=1	Practical=1	Home study=4	Cp/ECTS=3
Semester	II				
Year	II				
Pre-requisites	None				
Target group	Bachelor Veterinary Science				
Status	Compulsory				
Instructor name and address					

2. Course Description

the course deals with introduction to draft and pack animals, the role of draft animals in developing countries, selection of draft animals, principles and practices of management, nutrition and feeding systems of pack animals, breeding for efficient economic production and utilization of draft animals. Besides, harnessing systems, power sources, fundamental of forces, evaluation of animals and implements, species of animal used as source of draft and pack power harnessing systems for draft and pack selection of draft implements and harnesses, welfare of working animals with due emphasis on five animal freedoms, animal traction implements and hitching animal traction and packing in Ethiopia, constraints of animal traction and methods of improvement.

3. Objectives of the Courses

At the end of the course student should able to:

- Describe animal traction
- Identify the roles of animal traction and pack
- Capable of selecting pack and draft animals
- Explain harnessing and its complications
- Identify yoke types, explain about the merits and demerits of yoke harnessing
- Explain about the merits and demerits of collar harnessing, breast band harnessing and Collar-type yokes and pack
- Compare and contrast different transport equipments

- Compare and contrast primary tillage & secondary tillage equipments
- Describe about the factors considered during development of implements
- Grasp the concept of power and compare and contrast various power sources
- Summarize the history of animal traction and pack in Ethiopia
- Identify the constraints of animal traction and pack improvement
- Describe the approach towards smallholder mechanization technology development and promotion
- Demonstrate the different management practices of draft and pack animal
- Acquire awareness about animal welfare
- List five frameworks for assessing animal welfare

4.Syllabus Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning outcome
1,2	<p>CHAPTER 1: INTRODUCTION</p> <p>1.1 Role of draft Animal and animal traction in developing countries</p>	<p>✓ Introduce draft animal</p> <p>✓ Providing short note on draft animal</p> <p>✓ Short note on importance of draft animal</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Ask and answer question</p>	<p>✓ Understand draft animal</p>
3,4	<p>CHAPTER 2: Species Of Animal Used As Source Of Draft& Pack Power</p> <p>2.1 Choice of draft & pack animals</p> <p>2.2 Cattle as source of draft power</p> <p>2.3 Use of equine as source of draft & pack power</p>	<p>✓ Lecturing use of different types of animal species</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all the confusion/doubts in relation to the given lecture</p> <p>✓ Ask and answer question</p>	<p>Describe each animal species related to draft power</p>

5,6,7	Chapter 3 : Harnessing Systems For Draft & Pack 3.1 definition of harness 3.2 choice of harnessing systems 3.3 types of draft harnesses	✓ Introduce harnessing system ✓ Lecture types of harnessing system ✓ Providing short note on breeds characteristics ✓ Short note on selection principle harnessing type	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask and answer question	✓ Understand harnessing types and selection
8,9	Chapter 4: Animal Traction Implements And Hiching	✓ Brainstorming ✓ Lecture on animal traction system ✓	✓ Listen the lecture and take notes from the lecture ✓ Forward all the confusion ✓ Take reading assignment	✓ Explain the animal traction implementation
10	CHAPTER 5: Power Sources 5.1 Animal power 5.1.1 Determining power requirements 5.2 Hand hoe, animal power & tractor	✓ Lecture on power source ✓ Provide short note	✓ Listen the lecture and take notes from the lecture ✓ Forward all doubts in relation to the given lecture ✓ Class discussion	✓ Understand different source of power

<p>11</p>	<p>CHAPTER 6: ANIMAL TRACTION AND PACKING IN ETHIOPIA</p> <p>6.1 Mouldboard plough</p> <p>6.2 Winged plough</p> <p>6.3 The tie-ridger</p> <p>6.4 Row planter</p> <p>6.5 Inter row weeder</p> <p>minimum tillage trials using a ripper (sub-soiler)</p>	<p>✓ Brainstorming</p> <p>✓ Lecture on history of traction in Ethiopia</p>	<p>✓ Listen the lecture and take notes from the lecture</p> <p>✓ Forward all doubts in relation to the given lecture</p> <p>✓ Take reading assignment</p>	<p>✓ Understand animal traction and packing in ethiopia</p>
<p>12</p>	<p>Chapter 7: constraints of animal traction and methods of improvement</p>	<p>✓ Lecture on factures affecting animal</p>	<p>✓ Listen the lecture and take notes from the lecture</p>	<p>Identify constraints of animal traction and methods of</p>
<p>13,14,15</p>	<p>CHAPTER 8: WELFARE OF DRAFT ANIMAL</p> <p>8.1 Caring for draft & pack animals</p> <p>8.2 Different ways of defining animal welfare</p> <p>8.3 Five frameworks for assessing animal welfare/the five freedoms</p> <p>8.4 Nutrition and pack animals feeding</p> <p>8.4.1 Feeding donkeys</p> <p>8.4.2 Feeding Horses</p> <p>8.4.3 Feeding mules</p>	<p>✓ Brainstorming</p> <p>✓ Lecture on welfe of draft animal</p>	<p>✓ Listen lecture and take notes from the lecture</p> <p>✓ Forward all doubts relation to the given lecture</p> <p>✓ Take reading assignment</p> <p>✓ Group discussion and classwork</p>	<p>✓ Understand right and welfe of draft animal</p>
<p>16</p>	<p>Final exam</p>			
<p>4.2.assessment strategies and techniques and courses policy</p>				
<p>Assessment</p>				
<p>✓ Quiz7%</p>				
<p>✓ Test.....8%</p>				

✓	Assignment.....	10%
✓	Mid exam.....	25%
✓	Final exam.....	50%
✓	Total	100%

Courses policy
Student has to

- ✓ Attend 85% of the class
- ✓ take all continuous assessment and mid exam
- ✓ Take final exam
- ✓ Respect all rules and regulation of the university

References

William J.A Payne and R. Trevor Wilson (1990): An Introduction to Animal Husbandry in the tropics. 5 Ed .John wiley & sons Hoboken, New Jersey pp546 -575; 782-798

Denis Fielding & Patrick Krause (1998): Donkey Macmillan. London & Basingstoke

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 Pearson R.A, Lhotse P., Saaatamoinen M. and Martin- Rosette W. (2003): Working animal in Agriculture and transport, EAAP technical series no 6, Wageningen academic publisher

Proposed practical activity

Educational field trip

Approval section		
	Name	Signature
Chair holder		
Department head		

Poultry production and health



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1. Course Information

Module Name	Poultry and Camel production and health				
Module No.	18				
Course Title	Poultry production and health				
Course code	Vtsc-3181				
Credits hour (Cr hr) ECTS	Cr Hrs=3	Lecture Hrs=2	Laboratory=1	Home study=7	Cp/ECTS=5
Semester	I				
Year	III				
Target group	Bachelor Veterinary Science				
Pre-requisites	None				
Status of the course	Compulsory				
Instructor name and address					

2. Course description

Lecture: Definitions, causes, distribution, transmission, pathogenesis, clinical signs, postmortem examination, diagnosis, treatment, control and prevention of major infectious diseases (parasitic, bacterial, viral, fungal) and nutritional disorders of poultry prevalent in the tropics particularly in Ethiopia. Zoonotic poultry diseases are also described.

Practical: Demonstration of poultry necropsy techniques. Examination of dead or moribund poultry.

Collection, preservation, labeling and dispatching of morbid poultry materials. Visit to poultry farms, investigation of field outbreaks and report writing on the basis of examination results.

3. Course objectives

At the end of the course students should:

- Possess skills of diagnosing poultry diseases on the basis of symptoms, gross lesions and histopathological changes
- Have sound knowledge on the treatment, prevention and control measures
- Be able to make plausible decision at the time of outbreak without compromising the economy of the farmer or farm owner

4.Syllabous Components

4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1,2,3	1. Introduction 1.1.History of poultry production 1.2.poultry production type 1.3.poultry breed type 1.4.feeding system 1.5.	✓ Brainstorming about poultry management and husbandry ✓ Lecture on poultry management and husbandry ✓ Providing short note on poultry management and husbandry	✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Develops positive attitude towards the courses ✓ Describe scopes, uses, types of poultry mamangement & husbandry
4	2.Major Bacterial diseases of poultry 2.1. Avian salmonellosis 2.2. Avian Collibacillosis and clostridia infections	✓ Brainstorming about Avian salmonellosis, Avian Collibacillosis and clostridia infections ✓ Lecture on poultry Avian salmonellosis, Avian Collibacillosis and clostridia infections ✓ Providing short note on Avian salmonellosis, Avian Collibacillosis and clostridia infections	✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading	✓ Understand the methods of diagnosis, treatment and control of Avian salmonellosis, Avian Collibacillosis and clostridia infections

			assignment	
5	2.3. Mycoplasmal infections 2.4. Avian Tuberculosis	<ul style="list-style-type: none"> ✓ Brainstorming about Mycoplasmal infections, Avian Tuberculosis ✓ Lecture on poultry Mycoplasmal infections, Avian Tuberculosis ✓ Providing short note on Mycoplasmal infections, Avian Tuberculosis 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand the methods of diagnosis, treatment and control of Mycoplasmal infections, Avian Tuberculosis
6	2.5. Streptococcal and Staphylococcal infections	<ul style="list-style-type: none"> ✓ Brainstorming about poultry Streptococcal and Staphylococcal infections ✓ Lecture on poultry Streptococcal and Staphylococcal infections ✓ Providing short note on poultry Streptococcal and Staphylococcal infections 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand the methods of diagnosis, treatment and control of poultry Streptococcal and Staphylococcal infections
7	3. Fungal diseases of poultry 4.1. Aspergillosis &	<ul style="list-style-type: none"> ✓ Brainstorming about poultry Aspergillosis & 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all 	<ul style="list-style-type: none"> ✓ Understand the methods of diagnosis, treatment

	Aflatoxicosis	<p>Aflatoxicosis</p> <ul style="list-style-type: none"> ✓ Lecture on poultry Aspergillosis & Aflatoxicosis ✓ Providing short note on poultry Aspergillosis & Aflatoxicosis 	<p>confusion/doubts in relation to the given lecture</p> <ul style="list-style-type: none"> ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<p>and control of poultry Aspergillosis & Aflatoxicosis</p> <p>✓</p>
8	<p>4. Major Viral diseases of poultry</p> <p>4.1. Newcastle Disease</p> <p>4.2 Avian Influenza</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Newcastle Disease, Avian Influenza ✓ Lecture note on Newcastle Disease, Avian Influenza ✓ Providing short note on Newcastle Disease, Avian Influenza 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<p>✓ Understand the methods of diagnosis, treatment and control of Newcastle Disease, Avian Influenza</p>
9	<p>4.3. Infectious Bronchitis,</p> <p>4.4 Infectious Laryngotracheitis,</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Infectious Bronchitis, Infectious Laryngotracheitis, <p>Lecture note on Infectious Bronchitis, Infectious Laryngotracheitis,</p> <ul style="list-style-type: none"> ✓ Providing short note on Infectious Bronchitis, Infectious laryngotracheitis, 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<p>✓ Understand the methods of diagnosis, treatment and control of Infectious Bronchitis, Infectious Laryngotracheitis,</p>

10	4.5. Infectious Bursal Disease, 4.6, Marek's Disease and 4.7. Lymphoid Leukosis	<ul style="list-style-type: none"> ✓ Brainstorming about Infectious Bursal Disease, Marek's Disease and . Lymphoid Leukosis ✓ Lecture note on Infectious Bursal Disease, Marek's Disease and Lymphoid Leukosis ✓ Providing short note on poultry Infectious Bursal Disease, Marek's Disease and. Lymphoid Leukosis 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	Understand the methods of diagnosis, treatment and control of Infectious Bursal Disease, Marek's Disease and . Lymphoid Leukosis
11	4.9. Fowl Pox, , 4.10 Avian Encephalomyelitis, 4.11 Viral arthritis	<ul style="list-style-type: none"> Brainstorming about Fowl Pox, Avian Encephalomyelitis, Viral arthritis Lecture note on Fowl Pox, Avian Encephalomyelitis, Viral arthritis Providing short note on Fowl Pox, Avian Encephalomyelitis, Viral arthritis 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	Understand the methods of diagnosis, treatment and control of Fowl Pox, Avian Encephalomyelitis, Viral arthritis
12	5. Major Parasitic Diseases of Poultry 5.1. Protozoal diseases	<ul style="list-style-type: none"> ✓ Brainstorming about Protozoal diseases ✓ Lecture note on 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given 	✓ Understand the methods of diagnosis, treatment and control of

		<p>Protozoal diseases</p> <ul style="list-style-type: none"> ✓ Providing short note on Protozoal diseases poultry 	<p>lecture</p> <ul style="list-style-type: none"> ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<p>Protozoal diseases</p>
13	<p>5.2. Helminthes and ectoparasites</p> <p>5.2.1 Helminthes</p> <ul style="list-style-type: none"> ✓ Ascaris ✓ Capillaria ✓ Syngamus ✓ Cestode 	<ul style="list-style-type: none"> ✓ Brainstorming about major poultry Helminthes ✓ Lecture note on major poultry Helminthes ✓ Providing short note on poultry major poultry Helminthes 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand the methods of diagnosis, treatment and control of major poultry Helminthes
14	<p>5.2.2 Ectoparasites</p> <ul style="list-style-type: none"> ✓ Lice ✓ Flea ✓ Tick ✓ mite 	<ul style="list-style-type: none"> ✓ Brainstorming about major poultry Ectoparasites ✓ Lecture note on major poultry Ectoparasites ✓ Providing short note on major poultry Ectoparasites 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand the methods of diagnosis, treatment and control major poultry Ectoparasites
15	<p>6. Major Nutritional Disorders of</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Vitamin deficiency ✓ Lecture note on Vitamin 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in 	<p>Understand the methods of diagnosis, treatment and control of Vitamin</p>

	<p>poultry</p> <p>6.1. Vitamin deficiency</p> <ul style="list-style-type: none"> ✓ Vitamin A ✓ Vitamin B2 ✓ Vitamin D ✓ Vitamin E 	<p>deficiency</p> <ul style="list-style-type: none"> ✓ Providing short note on Vitamin deficiency 	<p>relation to the given lecture</p> <ul style="list-style-type: none"> ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<p>deficiency</p> <ul style="list-style-type: none"> ✓
	<p>6.2. Mineral deficiency</p> <ul style="list-style-type: none"> ✓ Calcium ✓ phosphorus 	<ul style="list-style-type: none"> ✓ Brainstorming about Mineral deficiency ✓ Lecture note on Mineral deficiency ✓ Providing short note on poultry Mineral deficiency ✓ 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes ✓ Forward all confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<p>Understand the methods of diagnosis, treatment and control of Mineral deficiency</p>
16	Final exam			

4.2.assessment strategies and techniques and courses policy

Assessment

✓ Quiz	7%
✓ Test.....	8%
✓ Assignment.....	10%
✓ Mid exam.....	25%
✓ Final exam.....	50%
✓ Total	100%

Courses policy

0. Student has to

- ✓ Attend 85% of the class
- ✓ take all continuous assessment and mid exam
- ✓ Take final exam
- ✓ Respect all rules and regulation of the university

References

1. David E. Swayne , John R. Glisson, Larry R. Mc Dougald, Lisa K. Nolan, David L. Suarez, and Venugopal Nair (2008) . Diseases of Poultry 13th ed, Wiley Blackwell.
2. FAO ECTAD (2010) picture book of infectious poultry diseases, printing and publishing company Botswana ppcb
3. Ivan Dinev (2007). Diseases of Poultry a color Atlas, 1st edn. 2M PRINT HOUSE·Ltd, Bulgaria.
4. J.L. VEGAD (2007). a colour atlas of poultry diseases An Aid to Farmers and Poultry Professionals, 1st ed. International Book Distributing Co. India
5. P. Seneviratna. (1969). Diseases of poultry (including cage birds) 2nd ed. john wright & sons ltd, Bristol
6. Saif, H John Barnes, John R Glissonaly M Fadly, Larry R Mcdougald, David E Swayne (2008).Diseases of Poultry. [Iowa State University Press](#)
7. Calnek, B. W., Barnes, H.J., Beard, C.W. Reid, W.M. and Yoder, H.W. (1991): Disease of poultry, 9th edition.
8. Coles, B.H. (1997): Avian Medline and surgery, 2nd edition.
9. Curtis, P. (1996) A handbook of poultry and Game bird diseases, 4th edition

Proposed Practical activity

- ✓ Examination of dead or moribund poultry.
- ✓ Collection, preservation, labeling and dispatching of morbid poultry materials.
- ✓ Visit to poultry farms, investigation of field outbreaks and report writing on the basis of examination results.

Approval section

	Name	Signature
Chair holder		
Department head		

Camel production and health



Bahir Dar University
College of Agriculture and Environmental Science
School of animal science and veterinary medicine

1.Course Information

Module Name	Poultry and Camel production and health				
Module No.	18				
Course Title	Camel production and health				
Course code	Vtsc-3182				
Credits hour (Cr hr) ECTS	Cr Hrs=2	Lecture Hrs=2	Laboratory=0	Homestudy=4	Cp/ECTS=3
Semester	I				
Year	III				
Target group	Bachelor Veterinary Science				
Pre-requisites	None				
Status of the course	Compulsory				
Instructor name and address					

2.Course description
Lecture: Origin, taxonomy and breeds of dromedary camels. Environmental adaptation, thermoregulation and water balance. Importance of camel production, reproductive performances, husbandry practices and constraints will also be addressed. Selected systemic diseases, of the respiratory, integumentary, musculoskeletal and reproductive systems. Major microbial, parasitic and deficiency diseases with emphasis on diagnosis, treatment and control measures

3. Course objectives
 At the end of the course students should:

- ✓ Get Familiarize with adaptation mechanisms, functions and behavior of camel and its influence on health
- ✓ Able to know the etiology, pathogenesis, transmission, diagnoses and treatment/control options of those major camel diseases.
- ✓ Able to assess the economic impact of major camel disease on camel production

4.Syllabus Components
4.1.Course Contents, Methods, Strategies, and Learning Outcome

Weeks	Content and sub-content	methods, strategies	Student tasks	Learning out come
1	<p>Part I. Camel disease</p> <p>Chapter1: origin & distribution of camel</p>	<ul style="list-style-type: none"> ✓ Brainstorming about origin & distribution of camel ✓ Lecture on origin & distribution of camel ✓ Providing short note on origin & distribution of camel 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Get familiarized with origin & distribution of camel

2	<p>Chapter 2: Reproduction and Behavior of camel</p> <p>2.1 The male and female reproductive organs 2.2 Estrus 2.3 Rutting 2.4 Heat and pregnancy diagnosis 2.5 Dystocia</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Reproduction and Behavior of camel ✓ Lecture on Reproduction and Behavior of camel ✓ Providing short note on Reproduction and Behavior of camel 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Get familiarized with Reproduction and Behavior of camel
3	<p>Chapter 3: Adaptation Mechanisms of Camel to its Environment</p> <p>3.1 Anatomical adaptations 3.2 Physiological adaptations 3.3 Behavioral adaptations</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Adaptation Mechanisms of Camel to its Environment ✓ Lecture on Adaptation Mechanisms of Camel to its Environment ✓ Providing short note on Adaptation Mechanisms of Camel to its Environment 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand about Adaptation Mechanisms of Camel to its Environment
4	<p>Chapter 4: Systemic diseases</p> <p>4.1 Trypanosomosis (Surra) 4.2 Pasteurellosis</p>	<ul style="list-style-type: none"> ✓ Brainstorming about Trypanosomosis(Surra), Pasteurellosis ✓ Lecture on Trypanosomosis(Surra), Pasteurellosis ✓ Providing short note on Trypanosomosis(Surra) 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward all confusion/doubts in relation to the given lecture ✓ Peer idea sharing ✓ Ask & answer 	<ul style="list-style-type: none"> ✓ Equipped with methods of clinical examinations of Trypanosomosis (Surra), Pasteurellosis ✓ understand & appreciate diagnostic methods, treatment and control of

), Pasteurellosis	question ✓ Take part on reading assignment	Trypanosomosis (Surra), Pasteurellosis
5	4.3 Brucellosis 4.4 Tuberculosis	✓ Brainstorming about Brucellosis & Tuberculosis ✓ Lecture on Brucellosis & Tuberculosis ✓ Providing short note on Brucellosis & Tuberculosis	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Equipped with methods of clinical examinations of Brucellosis & Tuberculosis ✓ understand and appreciate diagnostic methods, treatment and control of Brucellosis & Tuberculosis
6	4.5 Anthrax 4.6 Mastitis	✓ Brainstorming about Anthrax & Mastitis ✓ Lecture on Anthrax & Mastitis ✓ Providing short note on Anthrax & Mastitis	Listen the lecture and take notes from the lecture Forward confusion/doubts in relation to the lecture Peer idea sharing Ask & answer question Take part on reading assignment	✓ Equipped with methods of clinical examinations of Anthrax & Mastitis ✓ understand and appreciate diagnostic methods, treatment and control of Anthrax & Mastitis
7	Chapter 5: Camel Skin diseases 5.1 Camel pox 5.2 Contagious skin	✓ Brainstorming about Camel Skin diseases ✓ Lecture on Camel	✓ Listen the lecture and take notes from the lecture	✓ Equipped with methods of clinical examinations of

	necrosis, 5.3 Ringworm	Skin diseases ✓ Providing short note on Camel Skin diseases	✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	Camel Skin diseases ✓ understand and appreciate diagnostic methods, treatment and control of Camel Skin diseases
8	Chapter 6: Parasitic diseases 6.1 Helminthic parasitic diseases ✓ Nematodes ✓ Cestodes ✓ trematodes	✓ Brainstorming about helminthic parasitic diseases ✓ Lecture on helminthic parasitic disease ✓ Providing short note on helminthic parasitic disease	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	6.2 Equipped with methods of clinical examinations of helminthic parasitic diseases 6.3 understand and appreciate diagnostic methods, treatment and control of helminthic parasitic diseases
9	6.4 Camel Ectoparasites diseases ✓ Mange mite ✓ Ticks	✓ Brainstorming about Ectoparasites diseases ✓ Lecture on Ectoparasites diseases ✓ Providing short note on Ectoparasites diseases	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ understand and apply Ectoparasites diseases

10	Chapter7: Miscellaneous diseases ✓ Wound and abscess	✓ Brainstorming about Wound and abscess ✓ Lecture on Wound and abscess ✓ Providing short note on Wound and abscess	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Equipped with methods of clinical examinations of Wound and abscess ✓ understand and appreciate diagnostic methods, treatment and control of Wound and abscess
11	Part II. Camel Production Chapter 8: Camel production systems	✓ Brainstorming about Camel production systems ✓ Lecture on Camel production systems ✓ Providing short note on Camel production systems	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Get familiarize with the different Camel production systems

	Chapter 9: Camel breeds and breeding	<ul style="list-style-type: none"> Brainstorming about Camel breeds and breeding ✓ Lecture on Camel breeds& breeding ✓ Providing short note on Camel breeds and breeding 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Get familiarize with the different Camel breeds and breeding techniques
13	Chapter 10: Camel feed & Feeding	<ul style="list-style-type: none"> ✓ Brainstorming about Camel feed & Feeding ✓ Lecture on Camel feed & Feeding ✓ Providing short note on Camel feed & Feeding 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on reading assignment 	<ul style="list-style-type: none"> ✓ Understand about Camel feed & Feeding
14	Chapter 11: camel House	<ul style="list-style-type: none"> ✓ Brainstorming about camel house ✓ Lecture on camel house ✓ Providing short note on camel house 	<ul style="list-style-type: none"> ✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Pear idea sharing ✓ Ask & answer question ✓ Take part on 	<ul style="list-style-type: none"> ✓ Understand about camel house

			reading assignment	
15	Chapter 12: Utilization of the camel (Milk, Meat, Transportation, Hair, Skin) ✓ Marketing of camel products	✓ Brainstorming about Utilization & Marketing of camel products ✓ Utilization & Marketing of camel products Lecture on ✓ Providing short note on Utilization & Marketing of camel products	✓ Listen the lecture and take notes from the lecture ✓ Forward confusion/doubts in relation to the lecture ✓ Peer idea sharing ✓ Ask & answer question ✓ Take part on reading assignment	✓ Understand about Utilization & Marketing of camel products
16	Final exam	✓	✓	

4.2.assessment strategies and techniques and courses policy

Assessment

➤ Quiz	7%
➤ Test.....	8%
➤ Assignment.....	10%
➤ Mid exam.....	25%
➤ Final exam.....	50%
➤ Total	100%

Courses policy

Student has to

- ✓ Attend 85% of the class
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- ✓ Take final exam
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References

1. Schwartz H. J. and Dioli M. 1992. The One-humped Camel in Eastern Africa. A Pictorial Guide to Diseases, Health Care and Management. Verlag Josef Margraf, FR Germany
2. Wilson R. T. 1984. The Camel. Longman, London and New York
3. Kohler-Rollefson, I., Mundy, P. and Mathias, E. 2001. A Field Manual of Camel Diseases. Intermediate Technology Group Publishing, London, UK. 254

Approval section

	Name	Signature
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Chair holder		
Department head		