- **Course Level:** Third-Year Level
- **Course Name**: Theoretical General Pathology /3 hours
- **Course Name**: Practical General pathology/3 hours
- **Semester:** First
- **Unit:** 5

Course Objectives

Upon completion of this course, the student should be familiarized with:

1. To provide students with important knowledge about general aspects of pathology.
2. To make students understand the pathogenesis aspects of diseases.
3. To make students familiar with etiological factors of different diseases.
4. Students will be trained on how they deal with preparation of tissues samples.
5. To make students familiarized with characteristics lesions of diseases, macroscopic and microscopic recognition of veterinary diseases.

Course Contents

Course Content		
week	**Topics**	**Hours**
	Theoretical Subject	
1	Introduction / Degeneration and its types	3
2	Necrosis and its types	3
3	Gangrenous necrosis and its types / Gout	3
4	Disturbances of pigmentation (Jaundice causes and types, hemosiderin, melanin, calcification and its types)	3
5	Disturbance of growth (atrophy, hypertrophy, hyperplasia, hypoplasia, metaplasia, aplasia, congenital anomalies)	3
6 and 7	Disturbances of circulation (congestion, hemorrhage, thrombi, emboli, infarction, edema types and causes	6
9	Inflammation (definition, causes, types of inflammatory cells, types of inflammation)	8
10	Healing and repair / immunopathology	8
11	Tumors (definition, theories, of origion, classification, differentiation between benign and malignant tumors, histological characters of tumors, methods of transmission	8
Total		45

Course Contents

Course Content		
week	**Topics**	**Hours**
	Practical Subject	
1,2 and 3	Solutions and fluids used in fixation and preservation of tissue samples used as preservative samples.	6
4,5,and 6	Methods of processing and preparation of tissue for microscopically examination.	6

7,8 and 9	Methods of embedding and preparation of tissues blocks	6
10 ,11 and 12	Methods of cryostat for frozen sections	6
5	methods of reaction and special tissue stain	7
6	frozen section microtome for pathological detection of fat and enzymes	7
7	practical training in examination and diagnosis of many pathological conditions as histological section, lintin slides, digital photos and fixed samples (gallery samples)	7
Total		45

Mode of Assessment

Assessment	Score	Period
First Exam	10	10-11th weeks
Second Exam	10	10-11th weeks
Practical Exam	10	10-11th weeks
Assignment, Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th.
Final Exam	60	After the 16th.

Textbooks and Recommended References

- Harsh Mohan. (2015).Textbook of pathology. 7th edition. The health sciences publishers.
- Simon S. Cross.(2013). Under wood of pathology a clinical approaches. 6th ed. Churchill Livingstone Elsevier.
- Kumar, V.; Abas, A. and Jon, A. (2013). Robin basic pathology. 9th ed. Elsevier.
- Manuals of histopathology

- **Course Level:** Third-Year Level
- **Course Name**: Theoretical Systematic Pathology/ /3 hours
- **Course Name**: Practical Systematic pathology /3 hours
- **Semester:** Second
- **Unit:**5

Course Objectives

Upon completion of this course, the student should be familiarized with:

An overview of all causes, pathogenesis, macroscopical and microscopical aspects of different diseases in the body of animals:

Course Contents

Course Content		
week	**Topics**	**Hours**
	Theoretical Subject	
1-2	Systematic pathology	6
	Diseases of respiratory system / upper and lower tract/ lung / pleura	
2-3	Diseases of cardiovascular system	5
4	Diseases of hemopoetic and lymphatic tissues	3
5-7	Diseases of digestive system	8
8	Diseases of urinary system	4
9	Diseases of male and female genital system	3
10	Diseases of musculoskeletal system	4
11	Diseases of nervous system	3
12	Diseases of endocrine system	3
13	Diseases of skin and accessory	3
14	Diseases of eye and special organs	3
Total		45

Course Contents

Course Content		
week	**Topics**	**Hours**
1	Histopathological practice for examining of upper respiratory tract	5
2	Histopathological section and fixed gross samples of endocarditis and myocarditis and pericarditis caused by bacteria and parasites	5
3	Pathological affections of aorta and other blood vessels (gross and histopathological section)	5
4	Pathological affection of digestive system including gingivitis and other mucosal epithelial affection (FMD, and wooden tongue)	5
5	Gastroenteritis, parasitic affection of stomach, intestinal obstruction, Coccidiosis, (gross and histopathological practice)	5
6	Liver necrosis, liver cirrhosis, abscess, parasitic infection of liver and bile duct and dall bladder.	4

	Microscopic slides of pathological infection of kidney urethras and urinary bladder. Hematuria in farm animals.	
7	Microscopic slides of metritis and salpinigitis, suppurative metritis, mastitis, testis and urinary tract	8
8	Microscopical slides of bone infection and cartilage, joints, osteomalacia, vit D deficiency, skin infection, myocytic and parasitic infection of skin.	4
9	Microscopic slides from general diseases cases	4
Total		45

Mode of Assessment

Assessment	Score	Period
First Exam	10	10-11th weeks
Second Exam	10	10-11th weeks
Practical Exam	10	10-11th weeks
Assignment, Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th.
Final Exam	60	After the 16th.

Textbooks and Recommended References

- Harsh Mohan. (2015).Textbook of pathology. 7th edition. The health sciences publishers.
- Simon S. Cross.(2013). Under wood of pathology a clinical approaches. 6th ed. Churchill Livingstone Elsevier.
- Kumar, V.; Abas, A. and Jon, A. (2013). Robin basic pathology. 9th ed. Elsevier.
- Manuals of pathological diseases.

- **Course Level:** Third-Year Level
- **Course Name**: Theoretical General Microbiology/3 hours
- **Course Name**: Practical General Microbiology/ 2 hours
- **Semester:** First
- **Unit:** 4

Course Objectives

Upon completion of this course, the student should be familiarized with:

6. To provide students with important knowledge about pathogenic microorganisms of veterinary significance
7. To make students understand the zoonotic aspects of microbial pathogens .
8. To make students familiar with pathogens that cause food and feed poisoning
9. Students will be trained on how they deal with clinical specimens of infectious diseases
10. To make students familiarized with culture characteristics, macroscopic and microscopic recognition of veterinary microbial pathogens

Course Contents

Course Content		
week	**Topics**	**Hours**
	Theoretical Subject	
1	Introduction & History of Microbiology: Introduction to Microbiology: Definition and branches of Microbiology, Historical introduction including work of Pasteur, Koch, Lister. Recent developments. History of Antibiotics	6
2	Structure of the Prokaryotic Cell	3
3	Microbial Growth & Nutrition	3
4	Control of Microbial Growth: Disinfectants, antibiotics and chemotherapy.	3
5	Microbial Metabolism	3
6 and 7	Bacterial Genetics	6
9	Mycology	3
10	Genus: Staphylococcus.	3
11	Genus: Streptococcus	3
12	genus: Corynebacterium	3
13	Genus: Arcanobacterium Genus: Nocardia Genus: Dermatophilus	3
14	Spirochaetes Genus: Leptospira	3
15	Genus: Borrelia Genus: Listeria	3
Total		45

Course Contents

Course Content		
week	**Topics**	**Hours**
	Practical Subject	
1	Safety in the microbiological laboratory, demonstration of laboratory equipments, their basic functions and handling. Microscope and microscopy: Bright field, dark field, phase contrast, fluorescent, etc.	2
2	Sterilization and disinfection: Physical agents including moist heat, dry heat, ionizing radiation, filtration, etc. Chemical agents including types, factors influencing activity, evaluation of antimicrobial activity (phenol coefficient)..	2
3	Bacteriological media: Preparation and demonstration of various culture media: (basic, enriched, selective, differential, enrichment, transport and storage media).	2
4	Isolation: processing of specimen for isolation, isolation in culture, anaerobic culture techniques. Bacterial colonies: Types and characteristics. Morphology: Shape and arrangement,	2
5	Measurement of bacterial growth: Total count, Turbidometric methods, viable count-standard plate count	2
6 and 7	Cell fractionation: cell wall preparations, extraction of LPS, extraction of flagellar antigens	2
8	*Preservation of bacterial cultures*	2
Detailed and comparative study of following bacteria with reference to morphology, biochemical reactions, physiology, serology and pathogenicity. Isolation from field materials, identification and characterization.		
9	Collection, preservation and submission of material/samples for laboratory diagnosis of bacterial and mycotic infections	2
10	***Salmonella* spp.:**	2
11	*E coli, Proteus, Klebsiella and other members of Enterobacteriaceae*	2
12	*Pseudomonas and Burkholderia*	2
13	*Pasteurella and Mannheimia*	2
14	*Brucella*	2
15	*Campylobacter and Helicobacter*	2
16	*Moraxella, Taylorella, Haemophilus*	2
Total		30

Mode of Assessment

Assessment	Score	Period
First Exam	10	10-11th weeks
Second Exam	10	10-11th weeks
Practical Exam	10	10-11th weeks
Assignment, Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th.
Final Exam	60	After the 16th.

Textbooks and Recommended References

- P.J. Quin, BK Markey, ME Carter, WJ Donnelly and FC Leonard. Veterinary Microbiology and Microbial Disease. Blackwell Science
- Peter Borriello, Patrick R. Murray and Guido Funke. Topley and Wilson's Microbiology and Microbial Infections, Bacteriology Volumes I & II. Hodder Arnold
- Glen Sonder J & Karen W Post. Veterinary Microbiology: Bacterial and Fungal Agents of Animal Diseases. Cold Spring Harbor Lab. Press.
- Veterinary clinical microbiology, By Patrick Quinn Bryan Markey , Mark Carter and G.R. Carter. 2nd Revised edition.2013.

- **Course Level:** Third-Year Level
- **Course Name**: Theoretical Systematic Microbiology/3 hours
- **Course Name**: Practical Systematic Microbiology/2 hours
- **Semester:** Second
- **Unit:**4

Course Objectives

Upon completion of this course, the student should be familiarized with:

An overview of classification and nomenclature of bacteria. Morphology, cultural characteristics, biochemical activities, resistance to physico-chemical agents, antigenic properties, toxins, association with animal diseases, diagnosis and immuno-prophylaxis for the following genera/groups:

Course Contents

Course Content		
week	**Topics**	**Hours**
	Theoretical Subject	
1& 2	*Systematic Bacteriology* *Genus: Clostridium*	6
3	*Genus: Mycobacterium*	3
4	*Genus: Pasteurella* *Genus: Moraxella*	3
5	Erysipelothrix:, Bacteriods (non-spore forming anaerobic bacteria),	3
6	*Family: Enterobacteriaceae- General features and classification* *Genus: Escherichia* *Genus: Salmonella* *Genus: Klebsiella* *Genus: Proteus*	3
7	*Genus: Yersinia* *Genus: Proteus*	3
8	*Genus: Pseudomonas* *Genus: Burkholderia* *Genus: Manheimia*	3
9	*Genus: Brucella*	3
10	*Genus: Taylorella* *Genus: Haemophilus*	3
11	*Genus: Mycoplasma*	3
12	*Rickettsia and Chlamydia*	3
13	Systematic Mycology	3
	Dermatophytes *Genus: Microsporum,* *Genus: Trichophyton,*	
14	*Genus Aspergillus:* *Candida albicans*	3

	Cryptococcus neoformans *Malassezia pachydermatis* *Blastomyces dermatitidis* *Coccidioides immitis*	
15	*Histoplasma capsulatum* *Histoplasma farciminosum* *Sporothrix schenckii* *Zygomycoses: Mucoqwrmycosis, Entomophthomycosis* *Rhinosporidium seeberi* *Fungi associated with mastitis and abortions in animals* *Mycotoxicoses*	**3**
Total		45

Course Contents

Course Content		
week	**Topics**	**Hours**
	Practical Subject	
1	Laboratory diagnostics of veterinary important Family *Pseudomonadaceae* (*Pseudomonas, Burkholderia*).	2
2	*Laboratory diagnostics of veterinary important agents from family* Vibrionaceae and Aeromonadaceae;, Bordetella, Francisella, Alcaligenes, Acinetobacter.	2
3	Laboratory diagnostics of veterinary important agents from genera *Staphylococcus, Micrococcus.*	2
4	Laboratory diagnostics of veterinary important agents from genera *Bacillus* **.**	2
5	Laboratory diagnostics of veterinary important agents from genera *Listeria, Erysypelothrix, Lactobacillus,*	2
6 and 7	Laboratory diagnostics of veterinary important agents from genera *Mycobacterium , Rhodococcus , Actinomyces ,Dermatophyllus*	2
8-9	Laboratory diagnostics of veterinary important agents from groups *Mycoplasma* (*M.bovis, M.hyopneumonea, M.gallisepticum*)	2
10	Laboratory diagnostics of veterinary important agents from genera *Clostridium***.**	2
11	Isolation and identification of common fungi contaminants and dermatophytes	2
12	Laboratory diagnostics of veterinaryimportant agents from genera *Rhodococcus , Actinomyces,Dermatophyllus*	2
13	Laboratory diagnostics of veterinaryimportant agents from *Corynebacterium*.	2
14	Laboratory diagnostics of veterinaryimportant*Streptococcus , Enterococcus , Lactococcus*	2 2
15,	Laboratory diagnostics of veterinaryimportant, *Chamydiae*	2
16	*Laboratory diagnostics of veterinaryimportant Rickettsiae,*	2
Total		30

Mode of Assessment

Assessment	Score	Period
First Exam	10	10-11th weeks
Second Exam	10	10-11th weeks
Practical Exam	10	10-11th weeks
Assignment, Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th.
Final Exam	60	After the 16th.

Textbooks and Recommended References

- P.J. Quin, BK Markey, ME Carter, WJ Donnelly and FC Leonard. Veterinary Microbiology and Microbial Disease. Blackwell Science
- Peter Borriello, Patrick R. Murray and Guido Funke. Topley and Wilson's Microbiology and Microbial Infections, Bacteriology Volumes I & II. Hodder Arnold
- Glen Sonder J & Karen W Post. Veterinary Microbiology: Bacterial and Fungal Agents of Animal Diseases. Cold Spring Harbor Lab. Press.
- Veterinary clinical microbiology, By Patrick Quinn Bryan Markey , Mark Carter and G.R. Carter.2nd Revised edition.2013.

- **Course Level:** Third-Year Level
- **Course Name**: Theoretical Parasitology/3 hours
- **Course Name**: practical Parasitology /2 hours
- **Semester:** First
- **Unit:** 4

Course Objectives

Upon completion of this course, the student should be familiarized with:

1. The taxonomical aspects for parasites.
2. The differentiation between each one.
3. The diagnostic features.
4. The veterinary important.
5. The clinical signs for parasitic infection.
6. The control and treatment animals with parasitic infection.

Course Contents

	Course Content	
week	**Topics**	**Hours**
	Theoretical Subject	
1	General Introduction, Definitions & Terms, Life cycle, Pathogenicity, Immunology, Transmission.	**4**
2	Phylum: Nematoda includes the families: 1- Hetrakidae 2- Subuluridae 3- Oxyuridae 4- Rhabdatidae 5- Strongyloidae 6- Trichonematidae 7- Ancylostomatidae 8- Trichostrongylidae 9- Dictyocaulidae 10- Metastrogyloidae 11- Trichuridae 12- Trichinellidae 13- Spriurodae 14- Fillaridae	**25**
3	Phylum: Platyhelminthes, Class: Trematoda includes the families: 1-Fasciolidae 2-Schistosomatidae 3-Paramphistomatidae 4-Dicrocoelidae	**8**

4	Phylum: Platyhelminthes, Class: Cestoda includes the families: 1-Taeniidae 2-Anoplocephalidae 3-Thysanosonidae 4-Davaineidae 5-Dipylidiidae 6-Hyminolipididae 7-Mesocestoidae 8-Diphylobothiridae	8
Total		45

Course Contents

week	Topics	Hours
	Practical Subject	
1-2	General Introduction, Collect, Preserve, Diagnose the parasites, include: 1-Feacal Sample 2-Urine & Genital Sample 3-Blood Sample	6
3	Trematoda, General Introduction *Fasciola sp., Dicrocolium sp.*	2
4	*Schistosoma sp., Paragonimus sp.*	2
5	*Clonorchis sinensis, Paramphistomum cervi*	2
6	*Ascaris lumbricoides & Parascaris equorum*	2
7	*Toxocara canis, Toxascaris leonina, Ascaridia galli*	2
8-9	*Heterakis gallinarum, Enterobius vermicularis*	2
10	*Strongyloides stercoralis* *Trichuris trichiura, Trichinella spirals*	2 2
11	*Ancylostoma sp., Haemonchus contortus, Bunostumum sp.*	2
12	Cestoda general information *Taenia saginata, Taenia solium*	2
13	*Taenia pisiformis, Taenia hydatigenia*	2
14	*Echinococcus granulosus, Dipylidium caninum*	2
Total		30

Mode of Assessment

Assessment	Score	Period
First Exam	10	10-11th weeks
Second Exam	10	10-11th weeks
Practical Exam	10	10-11th weeks
Assignment, Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th.
Final Exam	60	After the 16th.

Textbooks and Recommended References

- Soulsby, E. J. L., (1982). Helminthes, Arthropods and protozoa of domesticated animals, 7th ed. Bailliere
- Tindall, East Sussex, UK.
- Roberts, L. S. & Janovy, J. (1996). Foundations of Parasitology. 5th end., wmc. Brown publ. Chicago, USA.
- Schmidt, G. D. (1986). Hand book of Tapeworm Identification. CRC Press, Inc. Boca Raton, Florida. pp. 675.
- Gibsion, I. (2010). Hand book of Diagnostic parasitology.

- **Course Level:** Third-Year Level
- **Course Name**: Theoretical Parasitology/3 hours
- **Course Name**: practical Parasitology/2 hours
- **Semester:** second
- **Unit:** 4

Course Objectives

Upon completion of this course, the student should be familiarized with:

1. The taxonomical aspects for parasites.
2. The differentiation between each one.
3. The diagnostic features.
4. The veterinary important.
5. The clinical signs for parasitic infection.
6. The control and treatment animals with parasitic infection.

Course Contents

	Course Content	
week	**Topics**	**Hours**
	Theoretical Subject	
1	Phylum: Protozoa includes the families: 1-Trypanosomatidae 2-Trichomonadae 3-Monocercomonatidae 4-Eimeriidae 5-Sarcocystidae 6-Cryptosporidiidae 7-Plasmodiidae 8-Babesiidae 9-Theileriidae	25
2	Phylum: Arthropoda includes the families: 1-Ixodidae 2-Argasidae 3-Sarcoptidae 4-Psoroptidae 5-Tabanidae 6-Culicidae 7-Psychodidae 8-Simuliidae 9-Osteridae 10-Calliophoridae 11-Cimicidae 12-Haematopinidae 13- Crustacea	20
Total		45

Course Contents

week	Topics	Hours
	Practical Subject	
1	*Monezia sp., Raillietina sp.*	2
2	Protozoa general information *Entamoeba sp., Giardia sp.*	2
3	*Babeisia sp., Theileria sp.*	2
4	*Leishmania sp., Trypanosoma sp*	2
5	*Trichomonas sp., Toxoplasma sp.*	2
6	*Sarcocystes sp., Eimeria sp*	2
7	*Plasmodium sp.*	2
8	Arthropoda general information : Flea; *Ctenocephalus sp.*	2
9	Lice; *Pediculus sp., Haematopinus sp.*	2
10	Insects; *Anopheles sp., Culex sp.*	2
11	Myiasis: *Oestrus sp., Hypoderma bovis*	2
12	Ticks: *Boophilus sp., Amblyomma sp., Rhpicephulus sp.*	2
13	Ticks: *Argas sp., Hyalomma sp.,*	2
14	Mites: *Sarcoptes sp.,*	2
15	Crustacea: *Cyclops,*	2
Total		30

Mode of Assessment

Assessment	Score	Period
First Exam	10	10-11th weeks
Second Exam	10	10-11th weeks
Practical Exam	10	10-11th weeks
Assignment, Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th.
Final Exam	60	After the 16th.

Textbooks and Recommended References

- Soulsby, E. J. L., (1982). Helminthes, Arthropods and protozoa of domesticated animals, 7th ed. Bailliere
- Tindall, East Sussex, UK.
- Roberts, L. S. & Janovy, J. (1996). Foundations of Parasitology. 5th end., wmc. Brown publ. Chicago, USA.
- Schmidt, G. D. (1986). Hand book of Tapeworm Identification. CRC Press, Inc. Boca Raton, Florida. pp. 675.
- Gibsion, I. (2010). Hand book of Diagnostic parasitology.

- **Course Level:** Third-Year Level
- **Course Name**: Theoretical Immunology/2 hours
- **Course Name**: Practical Immunology/2 hours
- **Semester:** First
- **Unit:** 3

Course Objectives

Upon completion of this course, the student should be familiarized with:

1. The principle and excitement of immunology.
2. The important areas of immunology.
3. The impact of modern Veterinary medical practice in pharmacy, especially hypersensitivity and autoimmune diseases.
4. The humoral and cellular immune responses and their regulations.
5. The immunotherapy for various immunological disorders.
6. The various methods of wider current uses in serology (ELISA, RIA, FAB, etc…).
7. The immune system that will make the student better veterinarian.

Course Contents

	Course Content	
Week	**Topics**	**Hours**
	Theoretical Subject	
1	Principle of immunity and immune response(specific and nonspecific)	2
2	Antibodies (definition): Immunoglobulin structure, variation ,function and synthesis	2
3-4	Immunology of T and B cells	4
5	The complement system: Nature ,Function and pathways	2
6	Cells mediate immunity, Antigen recognition by T cells	2
7	Immunological tolerance	2
8	Types of Hypersensitivity, Mechanisms	2
9	Auto-immunity	2
10	Transplantation immunology	2
11	Principle of immune genetics	2
12	Immunoanaphylaxis reaction	2
13	Immunity of infection	2
14	Immunization and Vaccination (definitions)	2
15	Tumor and cancer immunology (definitions)	2
Total		30

Course Contents

Week	Course Contents	Hours
	Practical subject	
1	Introduction to immunology labs	2
2	Lab animals	2

3-4	Preservation of antigens and antibodies	4
5	Separation of immunoglobulins.	2
6	Complement Fixation Test	2
7	Precipitation test	2
8	Agglutination test .	2
9	Neutralization Test	2
10-11	Separation of lymphocytes from blood and lymph nodes	4
12-13	Preparation of antigens	4
14	Leukocytes	2
15	Phagocytosis	2
Total		30

Mode of Assessment

Assessment	Score	Period
First Exam	10	10-11th weeks
Second Exam	10	10-11th weeks
Practical Exam	10	10-11th weeks
Assignment, Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th.
Final Exam	60	After the 16th.

Textbooks and Recommended References

1. Mary Louise Turgeon (2014). Immunology &Serology in Laboratory Medicine, 5th Ed., Mosby, an imprint of Elsevier Inc., 3251 Riverport Lane St. Louis, Missouri 63043. 978-0-323-08518-2.
2. Gerald N. Callahan and Robin M. Yates (2014): Basic Veterinary Immunology, Published by University Press of Colorado 5589 Arapahoe Avenue, Suite 206C, Boulder, Colorado 80303. ISBN 978-1-60732-218-4.
3. Gerald N. Callahan and Robin M. Yates (2014): Basic Veterinary Immunology, Published by University Press of Colorado 5589 Arapahoe Avenue, Suite 206C, Boulder, Colorado 80303. ISBN 978-1-60732-218-4.
4. Abdul K. Abbas, Andrew H. Lichtman, and Shiv Pillai (2014): Basic Immunology; Functions and disorders of the Immune System, 4th Ed, Elsevier Saunders, 1600 John F. Kennedy Blvd. Ste 1800 Philadelphia, PA 19103-2899. Library of Congress Cataloging-in-Publication Data 978-1-4557-0707-2.

- **Course Level:** Third-Year Level
- **Course Name**: Theoretical Pharmacology/3 hours
- **Course Name**: Practical Pharmacology/2 hours
- **Semester:** First
- **Unit:** 4

Course Objectives

Upon completion of this course, the student should be familiarized with:

11. To provide students with important knowledge about base of important concept and principles of veterinary pharmacology and entry level ability to receive clinical instruction.
12. To make students understand of the world of pharmacology ,its culture and its people .
13. To make students familiar with a fundamental grasp of the concepts and principles of pharmacology.
14. Students will be trained on how they deal with pharmacological invegastation.
15. To make students familiarized with competence in oral and written communication concerning veterinary pharmacology .

Course Contents

Course Content		
week	**Topics**	**Hours**
	Theoretical Subject	
1	**Principles of pharmacology**: definition, Routes of drug administration , Methods of transport of drug across cell membrane, Pharmacokinetics,_absorption, effect of PH on drug absorption, determination of how much drug will be found on either side of a membrane , Factors which effect drug absorption, Bioavailability (F), Factors that influence bioavailability distribution, Factors effect on the drug distribution, Volume of distribution (Vd), Metabolism or biotransformation, Metabolism pathways, Factors with affect biotransformation, Elimination, clearance of drug, pharmacodynamics, Types of receptors, Characteristic features of receptor, Types of drug response, Therapeutic index, Agonists, Antagonists.	9
2	**-Drugs acting on autonomic nervous system**: Introduction, Neurotransmitters, The parasympathetic nervous system, Cholinergic drugs, Anticholinergic drugs, Ganglionic blocking drugs, Blockade of neuromuscular transmission (muscle relaxant), Sympathetic nervous system, Adrenergic agonists (sympathomimetics), Adrenergic antagonists, α-adrenergic blockers, β-adrenergic blockers.	10
3	**-Drugs acting on central nervous system:** Excitatory neurotransmitter, Inhibitory neurotransmitter, CNS stimulant, CNS depressant, Narcotics, Sedative, Anticonvulsants, Tranquilizer: Hypnotics, Analgesics: Narcotic analgesic, non-narcotic analgesic, General anesthesia, Stage of general anesthesia, Types of general anesthetic agent, Local anesthetics , mechanism of action, Clinical	10

	techniques of local anesthesia, example of local anesthetic agents.	
4	**Drugs affecting on gastrointestinal function:** Introduction, Sialagogues, Antisialagogues, Appetizer, Antacids, Carminative, Antizymotic, Emetics, Antiemetic, Cholagogues, Stomachic, laxatives, Adsorbant, Astringents, Antidiarrheal agents, antispasmodics, Gastrointestinal prokinetics – stimulants.	5
5	**Autacoids and anti-inflammatory drugs:** Introduction, Histamine, Mechanism of action, pharmacological action, Histamine agonists, Histamine antagonist ,Serotonin (5 HT), Pharmacological action, Serotonin agonists, Serotonin antagonists, Eicosanoids, Synthesis of important prostaglandins and leukotriens, Classification of prostanoid receptors, Plasma kinnins, Pharmacological effects of kinnins, Inhibitors of cyclooxygenase, Other autacoids agent .	8
6	**-Dermatopharmacology:** introduction, topical anti-infective agents, topical antibacterial agents, topical antifungal agent, topical antiviral agents, ectoparasiticides, emollients, astringents, skin disinfectants, keratolytics, caustic agents, counter irritants, Corticosteroid.	3
Total		45

Course Contents

Course Content		
week	**Topics**	**Hours**
1	Metrology	2
2 and 3	Nature and source of drugs	4
4	Pharmaceutical preparations and drug forms	2
5	Routes of drug administration	2
6	Variations in drug response(species and individual)	4
7 and 8	Microsomal enzymes activity induction and drug response	2
9	Excretion of drugs	2
10	Prescription writing	2
11 and 12	Dispensing	4
13	Action of drugs on the eyes	2
14	Action of drugs on isolated guinea pigs ileum	2
15	Drugs and effects on the rabbit intestine	2
16	Drugs and effects on the rabbit uterus	2
Total		**32**

Mode of Assessment

Assessment	Score	Period
First Exam	10	10-11th weeks
Second Exam	10	10-11th weeks
Practical Exam	10	10-11th weeks
Assignment, Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th.
Final Exam	60	After the 16th.

Textbooks and Recommended References

- Jim E. Riviere , Mark G. Papich . Veterinary Pharmacology and Therapeutics, 9th Edition
- Walter H. Hsu .Handbook of Veterinary Pharmacology 1st Edition
- Charles,W.E.(2010). Laboratory Guide in Pharmacology.Manuals of Pharmacology.

- **Course Level:** Third-Year Level
- **Course Name**: Theoretical Pharmacology/3 hours
- **Course Name**: Practical Pharmacology/2 hours
- **Semester:** Second
- **Unit:** 4

Course Objectives

Upon completion of this course, the student should be familiarized with:

1. To provide students with important knowledge about base of important concept and principles of veterinary pharmacology and entry level ability to receive clinical instruction.
2. To make students understand of the world of pharmacology ,its culture and its people .
3. To make students familiar with a fundamental grasp of the concepts and principles of pharmacology.
4. Students will be trained on how they deal with pharmacological invegastation.
5. To make students familiarized with competence in oral and written communication concerning veterinary pharmacology .

Course Contents

Course Content		
week	**Topics**	**Hours**
	Theoretical subject	
1	**Chemotherapy of microbial diseases:** Introduction, Chemotherapy, Classification of Antibacterials, Resistance of M.O to antibacterial, mechanism of resistance, method of transfer bacterial resistance, Penicillin, mechanism of action, types of penicillin, antibacterial activity , pharmacokinetic Side effect of penicillins, Dose, Cephalosporins, Mechanism of action, types of cephalosporins. antibacterial activity, pharmacokinetic, Side effect, bacitracin, Mechanism of action, antibacterial activity, pharmacokinetic, uses, Vancomycin, mechanism of action, antibacterial activity, side effect, polymyxins, mechanism of action, antibacterial activity, uses, side effect, Aminoglycosides, mechanism of action, activity, side effect. Tetracyclines, types, mechanism of action, activity, pharmacokinetic, side effect, Chloramphenicol, mechanism of action, activity, side effect, Macrolides, types, mechanism of action, activity, side effect, Lincosamides, types, mechanism of action, Activity, Side effect, Aminocyclitol, mechanism of action, Activity, Uses, Sulfonamides, -absorbable sulfonamide, non-absorbable sulfonamides, topical sulfonamides, mechanism of action, activity, side effect, Trimethoprim, mechanism of action ,uses, Side effect , Nitrofurans, absorbable, non-absorbable, Mechanism of action, Activity, Side effect , Refampin, Mechanism of action, uses, Side effect, Fluroquinolones, Types, Mechanism of action, Activity, Side effect, Metronidazole, Mechanism of action, Activity, Side effect, Basis of antibacterial combination. Types of antibacterial combinations. Reasons of failure of treatment with antibacterial. growth promoter.	10

2	**Chemotherapy of parasitic disease**: Introduction, Anthelmintic, antinematodes: avermectins and milbemycins, benzimidazoles, imidazothiazoles, organophosphorous compound, Tetrahydropyrimidines, piprazine, diethylcarbamazine, phenothiazine, Anticestodes:praziquantel, niclosamide, benzimidazole, arecoline hydrobromide, dichlorophen, nitroscanate, anti trematodes, carbon tetrachloride, benzimidazole, clorsulon, oxyclozanide and rafoxanide, nitroxinil, diamfenetide, Antiprotozoal drugs: Anticoccidial drug: sulfonamides , nitrofurans, thiamine antagonist(amprolium, diaveridine, ethopabate), quinolates, robenidine, aprinocid, Antibabesial drugs : quinuronium sulphate, amicarbalide, imidocarb, diminazene, Anti theileriosis : chlortetracycline and oxytetracycline, hydroxynapthoquinones, gloxanane, Antitrypanosomal drugs : quinapyramine, phenanthridinium compound, diminazine, suramin, Antitoxoplasmosis drug: sulfonamide and trimethoprim ,clindamycin and clarthromycin, Antitrichomonal drug : nitroimidazole derivatives, Antihistomoniasis drugs : dimetridazole,	10
3	**Drugs acting on cardiovascular system:** introduction, Inotropic drug: cardiac glycosides, Sympathomimetic, Parasympatholytic, xanthine derivatives, Antidysrhythmic agent : Quinidine, procainamide, Lidocaine, Vasodilators : Glyceryl trinitrate, Isosorbide dinitrate, Hydralazine and minoxidil, Coagulants and anticoagulant , Fibrinolytic, Antithrombosis, Hematinics.	10
4	**Renal pharmacology :**introduction, Diuretics: diuretics acting on early distal tubule, loop diuretics: Potassium – sparing diuretics : Carbonic anhydrase inhibitor : osmotic diuretics : urolith treatment: urinary acidifiers: urinary alkalinizers : xanthine oxidase inhibitors.	5
5	**Drug acting on the respiratory system:** introduction, expectorant, mucolytics, anti-tussives, anti – asthmatic drugs, bronchodilators, antiinflammatory agents, mast cell stabilizers, respiratoty stimulant, decongestants.	8
6	**Drugs acting on reproductive system**: introduction, pituitary gland hormones: Anterior pituitary hormones, posterior pituitary hormones, pancreas hormone, Thyroid gland hormones, Adrenal cortex hormones, Adrenocortical insufficiency, Hyperadrenocorticism, Gonadotrophin – releasing hormone (GnRH), Sex Hormone, Drugs affecting uterine motility, Uterine muscles stimulants , Uterine muscle relaxants.	2
Total		45

Course Contents

Course Content		
week	**Topics**	**Hours**
	Practical Subject	
1	Neuromuscular blocking (on the frog)	2
2	Calculation of drug dosage	2
3	Xylazine-ketamine anesthesia in rabbits.	2
4	Dose response relationships(ED50, LD50, TI)	2
5	Anticonvulsants	2
6	Determination of blood cholinesterase activity	2
7	Organophosphate poisoning in rats or mice	2
8	Xylazine effects in sheep	2
9	Diuretics	2
10	Asprin toxicity(comparison with acetaminophen)	2
11	Veterinary pharmaceutical preparations	2
12	Neurobehavioral effects of drugs and toxicants	2
13	Effect of drugs on the perfused heart	4
Total		**30**

Mode of Assessment

Assessment	Score	Period
First Exam	10	10-11th weeks
Second Exam	10	10-11th weeks
Practical Exam	10	10-11th weeks
Assignment, Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th
Final Exam	60	After the 16th.

Textbooks and Recommended References

- Jim E. Riviere , Mark G. Papich . Veterinary Pharmacology and Therapeutics, 9th Edition
- Walter H. Hsu .Handbook of Veterinary Pharmacology 1st Edition
- Charles,W.E.(2010). Laboratory Guide in Pharmacology.Manuals of Pharmacology.

- **Course Level:** Third-Year Level
- **Course Name**: Theoretical Toxicology/3 hours
- **Semester:** First
- **Unit:** 3

Course Objectives

Upon completion of this course, the student should be familiarized with:

To provide students with an understanding and knowledge of clinical pharmacology, toxicology and therapeutic. The course particularly covers the mechanisms of various drug actions, the PD/PK principles that are fundamental for the therapeutic uses and safe selection of therapeutic agents in clinical veterinary practice. in addition, students will also gain knowledge of important aspects of toxicology and therapeutics. functions of organs.

Course Contents

Course Content		
week	**Topics**	**Hours**
	Theoretical Subject	
1	Definitions, factors affecting the activity of poisons, Diagnosis , Principle of treatment of poisoning, Classification of toxic agents, (types or degrees) of toxicity, Toxicokinetics:, -Absorption of toxicants, distribution:, metabolism, elimination, routes of elimination / excretion: Toxicodynamics:, -binding -interaction -induction of toxic effects . Steps of poisoning treatment, Metals toxicity: Lead poisoning , Sources of lead toxicity, Clinical signs, Treatment, Mercury poisoning: Sources of poisoning, Clinical signs, Treatment, Arsenic poisoning	9
2	Sources of poisoning : Clinical signs, Treatment, Copper poisoning : Sources of poisoning , Clinical signs, Treatment, Selenium poisoning: Sources of poisoning, Clinical signs, Treatment, Molybdeium poisoning : Sources of poisoning : Clinical signs, Treatment, nitrate and nitrite poisoning: Sources of poisoning : Clinical signs, Treatment, sodium chloride (common salt) poisoning : Sources of poisoning : Clinical signs, Treatment,	10
3	- Organophosphorus compound poisoning : Sources of poisoning, Clinical signs, Treatment, Nicotine poisoning : Sources of poisoning, Clinical signs, Treatment, Morphine poisoning : Sources of poisoning, Clinical signs, Treatment, atropine poisoning : Sources of poisoning, Clinical signs, Treatment, Cyanide poisoning : Sources of poisoning, Clinical signs, Treatment, food toxicants : natural contaminants of food . some poisonous plants : aflatoxins : clinical signs , prevention and treatment , Ergot poisoning: Toxicity, Treatment, Ammoniated feed poisoning:	10
4	Toxicity, Clinical signs, Treatment, Gossypol poisoning : Mechanism of action , Clinical signs, Treatment. Sulfur:Sources, Toxicity, Clinical signs, Treatment, Fungicide poisoning : Toxicological of pesticides : Organophosphates, Insecticidespoisoning, Herbicide poisoning ,	5

	rodenticide poisoning , Mechanism of action , Clinical signs, Treatment.	
5	Environmental toxicology :Air pollution : carbon monoxide , Sulphur dioxide, nitrogen oxides. water pollutants : sources. Toxin s of animal origin : Venoms of bee ,hornets and wasps :clinical signs , treatment, snake venom : Clinical signs, Diagnosis , Treatment.	8
6	Scorpion venom : Clinical signs, Treatment, Spider venom: Clinical signs, Treatment, Black widow spider: Clinical signs, Treatment, Fish toxins : Clinical signs, Treatment. Some poisonous plants in Iraq .	2
Total		44

Mode of Assessment

Assessment	Score	Period
First Exam	10	10-11th weeks
Second Exam	10	10-11th weeks
Practical Exam	10	10-11th weeks
Assignment, Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th.
Final Exam	60	After the 16th.

Textbooks and Recommended References

- Ramesh C. Gupta, Veterinary Toxicology Basic and Clinical Principles. First edition 2007
- Veterinary toxicology by Lander, G. D. (George Druce)

- **Course Level:** Third-Year Level
- **Course Name**: Theoretical Virology/2 hours
- **Course Name**: Practical virology/2 hours
- **Semester:** Second
- **Unit:** 3

Course Objectives

Upon completion of this course, the student should be familiarized with:

Student will learn the essential concepts of virology which include the structure of different viruses, properties, replication, types of infection, how viruses cause disease, immune response to infection, treatment and the inhibitory action of the antiviral chemotherapy and laboratory diagnosis..

Course Contents

	Course Content	
week	**Topics**	**Hours**
	Theoretical Subject	
1	Introduction to virology	2
2	Virus architecture	2
3	Properties of animal viruses	2
4	Viral classification	2
5	Replication of animal viruses	2
6	Antiviral drugs	2
7	Viral genetics	2
8	Oncogenic viruses	2
9	Picornaviridae, Orthomyxoviridae, Paramyxoviridae	2
10	Coronaviridae, Reoviridae, Retroviridae	2
11	Rhabdoviridae, Birnaviridae, Bornaviridae	2
12	Bunyaviridae, Togaviredae, Astroviridae	2
13	Arteriviridae, Caliciviridae, Flaviviridae	2
14	Herpesviridae, Poxviridae	2
15	Adenoviridae, Papillomaviridae	2
16	Parvoviridae, Circoviridae, Asfaviridae	2
Total		32

Course Contents

week	Topics	Hours
	Practical Subject	
1	Overview about diagnostic methods in veterinary virology	2
2	Collection and preservation of viral specimens	2
3	Electron Microscopy Examination	2
4	Sample Preparation for Virus Isolation	2
5	Cultivation of Viruses in Laboratory animals	2
6	Cultivation of Viruses in Chicken Embryos	2
7	Preparation of Cell Culture	2

8	Cultivation of Viruses in Cell Culture	2
9	Recognition of viral growth in cell culture (Cytopathic effect (CPE) and Hemadsorbtion)	2
10	Hemagglutination Tests and hemagglutination inhibition	2
11	Neutralization Techniques	2
12	Titration Techniques (Plaque assay and Endpoint Method)	2
13	Immunofluorescence Tests	2
14	western blot	2
15	Polymerase Chain Reaction (PCR) and RT-PCR	2
16	Restriction Endonuclease and Southern blot	2
Total		32

Mode of Assessment

Assessment	Score	Period
First Exam	10	10-11th weeks
Second Exam	10	10-11th weeks
Practical Exam	10	10-11th weeks
Assignment, Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th.
Final Exam	60	After the 16th.

Textbooks and Recommended References

- Fenner's Veterinary Virology", Eds. MacLachlan and Dubovi 4th ed. (2011).
- "Principles of Virology – Molecular Biology, Pathogenesis and Control of Animal Viruses" vol 1and 2, Eds. Flint, Enquist, Racaniello and Skalka, 3rd ed. (2009),
- S. N. Sharma, S. C. Adlakha (2009): **Textbook of Veterinary Virology**, 1st edition International book distributing CO. (Publishing Division) Khushnuma Complex Basement 7, Meerabai Marg (Behind Jawahar Bhawan) Lucknow 226 001 *V.P.* (INDIA). ISBN 978-81-8189-274-4
- Frederick A. Murphy, E. Paul J. Gibbs, Marian C. Horzinek, Michael J. Studdert (2000): **Veterinary Virology**, 3rd Edition, 525 B Street, Suite 1900, San Diego, California 92101-4495, USA. ISBN-13:978-0-12-511340-3

- **Course Level:** Third-Year Level
- **Course Name**: Clinic I/ 2hours
- **Semester:** Second
- **Units :** 2

Course Objectives

Upon completion of this course, the student should be familiarized with:

- Teach the students on history taking
- Learn how to examine of the sick animal by inspection, palpation , percussion and by use a tools
- Educated on how to provide patient care and treatment

Course Contents

Course Content		
week	**Topics**	**Hours**
1	Introduction & History taken	2
2	Clinical examination & diagnosis (Inspection& physical examination	2
3	Temperature	2
4-5	Examination of cardiovascular system	4
6-7	Examination of respiratory system	4
8-9	Examination of digestive system	4
10	Examination of lymph nodes Examination of udder and milk	2
11	Examination of urinary system	2
12	Examination of skin	2
13	Allergic tests	2
14	Routs and administration of drugs	2
15	Revision and Exam.	2
Total		30

Mode of Assessment

Assessment	Score	Period
First Exam	15	5-6th weeks
Second Exam	15	10-11th weeks
Assignment Projects, Quizzes, Tutorial	10	2nd, 3rd, 4th, 5th, and 7th, 8th, 9th, 10th, 11th.
Final Exam	60	After the 16th.

Textbooks and Recommended References

- Clinical Examination of Farm Animals BY Peter G.G. Jackson & Peter D Cockcroft (2002)
- Color atlas of diseases and disorders in cattle by. Blowey, Roger W and Weaver, A. David 2011 3rd Ed