

Dr A B Shrivastava – 9425800269

POST-GRADUATE CURRICULA & SYLLABI
For WILDLIFE HEALTH as per ICAR norms
 COMPALSORY NON-CREDIT COURSES
 FOR MASTER'S PROGRAMME IN ALL DISCIPLINE, OPTIONAL FOR PHD:

Subject	Master's Programme
Major	28
Minor + Supporting (min. 6 for minor & 3 for supporting)	11
Seminar	01
Research	20
Total credit	60
Compulsory non credit courses	PGS 501 Lib. and Information services 0+1
	PGS 502 Technical writing and Communication skills 0+1
	PGS 503 Intellectual Property and its (e course) Management 1+0
	PGS 506 Disaster Management (e course) 1+0

Table 1. Suggested list of specified minor subjects (departments)

Major Subject:

Wildlife Health Management.

Minor Subjects:

- i. Veterinary Anatomy.
- ii. Veterinary Parasitology.
- iii. Veterinary Microbiology.
- iv. Veterinary Pathology.
- v. Veterinary Medicine.
- vi. Animal Nutrition.
- vii. Animal Breeding and Genetics.
- viii. Veterinary Pharmacology and Toxicology
- ix. Veterinary Surgery and Radiology

Note: The choice of minor courses other than those listed above, may be allowed on the recommendations of advisory committee and essentially required as per research problem.

M.V.Sc. & A.H. Course Structure at Glance

COURSE NO.	COURSE TITLE	CREDITS	SEMESTER
WHM 601	Wild Animal Health Management and Diagnostics	2+1	I
WHM 602	Pathology and Medicine of Wildlife Diseases (Carnivore)	2+1	I
WHM 603	Pathology and Medicine of Wildlife Diseases (Herbivore)	2+1	II
WHM 604	Capture and Restraining of Wild Animals	2+1	II
WHM 605	Zoo Architecture	1+1	I/ II
WHM 606	Wildlife Forensics and Protection Laws	2+1	II
WHM 607	Pathology and Medicine of Non-human Primate and Reptilian Diseases.	2+1	II
WHM 608	Disease Management of Pet and Wild Birds	1+1	I
WHM 609	Necropsy Procedures and Correlated Pathology	0+3	I/II
WHM 610	Computer Application in Wildlife Sciences	0+1	I
WHM 611	Nutritional Management in Captivity.	1+1	I/ II
TOTAL CREDITS		28 (Twenty eight)	
WHM 691-Maters Seminar		1+0	
WHM 699-Masters research		20	

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PG Syllabus as per the ICAR Guidelines

Commented [AS1]:

**For
Master of Veterinary Science
In Wildlife Health
COURSE STRUCTURE AT A GLANCE**

M.V.SC. & A.H.:

S, No.	Course No.	Title of the course	Credit hours	Semester
1	WHM 601	Wild Animal Health Management and Diagnostics	2+1	I
2	WHM 602	Pathology and Medicine of Wildlife Diseases (Carnivore)	2+1	I
3	WHM 603	Pathology and Medicine of Wildlife Diseases (Herbivore)	2+1	II
4	WHM 604	Capture and Restraining of Wild Animals	2+1	II
5	WHM 605	Zoo Architecture	1+1	I/ II
6	WHM 606	Wildlife Forensics and Protection Laws	2+1	II
7	WHM 607	Pathology and Medicine of Non-human Primate and Reptilian Diseases.	2+1	I/III
8	WHM 608	Disease Management of Pet and Wild Birds	1+1	I
9	WHM 609	Necropsy Procedures and Correlated Pathology	0+3	I/II
10	WHM 610	Computer Application in Wildlife Sciences	0+1	I
11	WHM 611	Nutritional Management in Captivity.	1+1	I/ II

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1. Title of the course: **WILD ANIMAL HEALTH MANAGEMENT AND DIAGNOSTICS**

Semester : I Course No.: WHM 601(2+1)

Theory:

S. No.	Title of the lecture	No. of lecture
1	Unit – I What is wildlife health, history of wildlife diseases in India, factors affecting wildlife conservation, national wildlife action plan, Importance and procedure for wildlife health monitoring.	8
2	Unit -II Surveillance of diseases, Health status of various wild animals (haemogram, serum chemistry and physiological values)	8
3	Unit-III Management of sick animals in captivity, Nutrition(feeding practices) and health care, Prevention and control of diseases in captive system, Do's and Don'ts in the use of drugs in wild animals in captivity and free living range	10
4	UNIT IV Field investigations, Health monitoring, recording and submission of samples, sample collection, preservation, and dispatch for laboratory investigations.	6

Practical:

S. No.	Title of the lecture	No. of lecture
1	Unit - I Collection of blood and other important biological materials from different wild animals.	8
2	Unit - II Haematological techniques and their interpretations, biochemical analysis. Faecal and urine examinations and their interpretations	8

Dr A B Shrivastava – 9425800269

2. Title of the course: **PATHOLOGY AND MED. OF WILDLIFE DISEASES (CARNIVORES)**

Semester: I Course No.: WHM 602(2+1)

Theory:

S. No.	Title of the lecture	No. of lecture
1	Unit – I Important diseases, prevalence and Significance of diseases and their treatment in wildlife.	3
2	Unit – II Bacterial Diseases: Tuberculosis, Pseudotuberculosis, Anthrax, Pasteurellosis, Brucellosis, Listeriosis, Corynebacterial infections, E. Coli infections, Streptococcosis and staphylococcosis, clostridial infections, Leptospirosis & Mycoplasmosis, Aeromonas, Proteus and other infections	7
3	Unit -III Viral Diseases: Rabies, Pseudorabies, Herpes virus infection, Feline Panleukopenia, Canine Distemper, Canine Parvo virus infection, Feline infectious peritonitis, Feline calici virus infection, Canine Adenovirus infection, Feline infectious Rhinotracheitis, Feline Immune Deficiency Syndrome, Inclusion Body Hepatitis	5
4	Unit-IV Mycotic Diseases: Dermatomycosis, Aspergellosis, Aflatoxicosis, Candidiasis, Rickettsial diseases, Q fever	5
5	Unit-V Parasitic Diseases: Common parasitic diseases like Ancylostoma Infection, Ascariasis, Paragonimiasis, Heartworm infection of wild animals.	5
6	Unit-VI - Protozoan diseases- Babesiosis, Trypanosomosis / Surriosis, Sarcosporidiosis, Entamoebosis, Giardiasis, coccidiosis, Toxoplasmosis, Anaplasmosis,	5
7	Unit-VII Implementation and evaluation of programmes to control diseases in wildlife. Special medicine – Non infectious (Environmental- Stress, Capture Myopathy, Nutritional- Selenium, Vit. A, B1, B2, C, D, E, K, Niacin Deficiency, pantothenic acid Deficiency, Biotin Deficiency, folic Acid Deficiency) diseases of mammals	2

Practical:

S. No.	Title of the lecture	No. of lecture
1	Unit - I Collection, preservation and dispatch of different biological samples from the field.	4
2	Unit – II Field laboratory techniques	4
3	Unit – III Complete haemogram and serum biochemical profile.	3
4	Unit – IV Postmortem protocol for different wild carnivores	5

Dr A B Shrivastava – 9425800269

3. Title of the course: **PATHOLOGY AND MEDICINE OF WILDLIFE DISEASES (HERBIVORES)**

Semester: II Course No.: WHM 603(2+1)

Theory:

S. No.	Title of the lecture	No. of lecture
1	Unit – I Important diseases, occurrence, principles, concepts and significance of diseases and their treatment in wildlife.	3
2	Unit – II Bacterial Diseases: Tuberculosis, Paratuberculosis/ Jones Disease, Anthrax, Pasteurellosis, Brucellosis, Corynebacterial infections, Clostridial infections, Narcobacillosis, Streptococcosis and Staphylococcosis infections, Salmonellosis, E. Coli infection, Vibriosis, Actinomycosis	7
3	Unit -III Viral Diseases: Rabies, Foot and Mouth Disease, Rinderpest, Bovine Viral Disease, Peste Des Petitis, Herpes virus infection, Malignant Catarrhal fever, Blue Tongue, Pox, Arbo virus infection, Malignant Catarrhal fever	7
4	Unit-IV Mycotic Diseases: Dermatomycosis, Aspergellosis, Aflatoxicosis, Rickettsial diseases: Q fever,	3
5	Unit-V Parasitic Diseases: Trematosis, Paramphitosis, Ancylostomoidosis, Cestodosis, Ascarididosis, Oesophagotomosis	5
6	Unit-VI Protozoan diseases: Anaplasmosis, Babesiosis, Theileriosis, Trypanosomosis, Sarcocystosis, Entamoebosis, Coccidiosis	3
7	Unit-VII - Implementation and evaluation of programmes to control diseases in wildlife. Special medicine – Non infectious (Environmental-Stress, Capture Myopathy, Nutritional- Selenium, Vit. E, A, D, K, Iodine deficiency, Calcium and phosphorous deficiency) diseases of mammals.	4

Practical:

S. No.	Title of the lecture	No. of lecture
1	Unit - I Collection, preservation and dispatch of different biological samples from the field.	4
2	Unit – II Field laboratory techniques	4
3	Unit – III Complete haemogram and serum biochemical profile.	3
4	Unit – IV Postmortem protocol for different wild herbivores	5

Dr A B Shrivastava – 9425800269

4. Title of the course: **CAPTURE AND RESTRAINING OF WILD ANIMALS**

Semester : II

Course No.: WHM 604(2+1)

Theory:

S. No.	Title of the lecture	No. of lecture
1	Unit – I Physio-pathology of capture. Veterinary problems associated with the capture of wild animals	6
2	Unit -II Physical and chemical restraining of wild animals. Equipment and techniques. Pre-anesthetics, Pharmacology of drugs used for immobilization	10
3	Unit-III Planning of capture operation. Immobilization techniques for major native wild animals. Post capture care	10
4	UNIT IV Medical emergencies and human safety during capture operation. Legal aspects of wildlife restraining	6

Practical:

S. No.	Title of the lecture	No. of lecture
1	Unit - I Restraining methods, drugs and equipment, monitoring of restrained animal, anaesthetic complications in wild animals	6
2	Unit- II Management of emergency surgical affections of wild animals and birds.	5
3	Unit – III Handling and care of immobilization equipment and chemicals, preparation of dart (telinject and disinject), correct aiming, spotting and revival.	5

Dr A B Shrivastava – 9425800269

5. Title of the course: **ZOO ARCHITECTURE**

Semester : I/II Course No.: WHM 605(1+1)

Theory:

S. No.	Title of the lecture	No. of lecture
1	Unit – I National zoo policy, planning and establishment of new zoo. Zoo organization. General principles of shelter requirement.	4
2	Unit -II Objectives of zoo, General layout of large, medium and small zoos. Infrastructure and facilities requirements for each type of zoos. Enclosure designs, its spacing and flooring for different species of captive animals.	4
3	Unit-III Barrier designs, different types of cages, transportation of cages. Zoo exhibits. Guidelines for safari/park/deer park and others. Safety and security of zoo animals.	4
4	UNIT IV Management of diseases of captive animals. Maintenance of zoo records. Captive breeding programmes, domestication, management of domestic elephants.	4

Practical:

S. No.	Title of the lecture	No. of lecture
1	Unit - I Visit to Parks/zoo/safari.	4
2	Unit- II Practice for calculating floor space requirement and housing plan for captive animals. Maintenance of enclosures and cages.	6
3	Unit –III The use of barriers including electric fences, boundary demarcation, Development of hides and watch towers, Development of road and track systems.	6

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6. Title of the course: **PROTECTION LAWS AND WILDLIFE FORENSICS**

Semester: II

Course No.: WHM 606(2+1)

Theory:

S. No.	Title of the lecture	No. of lecture
1	Unit – I Illegal wildlife trade. Importance of forensic work. What is wildlife crime? Laws regulating wildlife crime. Legislation affecting wildlife and forest, Wildlife protection, and Forest Conservation Acts. International law, International conventions, CITES and its working.	8
2	Unit -II Techniques for Identification of hairs, skin, meat, bones, teeth and claws, antlers, horns of important wild animals. Comparative anatomy of important major bones of different species. Detection of time of death, characteristics of anti-mortem and post-mortem wounds, electrocution. Toxicological investigations. Importance of post-mortem, handling and collection of samples for various medico-legal cases.	12
3	Unit-III Conservation and management in Indian context. Wildlife as land use. Wildlife literature. Report and scientific writing. Wildlife Trade, Economics of wildlife, wildlife and human conflict, Compensation and its assessment.	8
4	Unit - IV Difference between human and wildlife forensic , determination of age and sex by different technique	6

Practical:

S. No.	Title of the lecture	No. of lecture
1	Unit - I Different laboratory techniques for identification of unknown species of animal.	4
2	Unit -II Utility of molecular techniques like ELISA and PCR in wildlife forensics	4
3	Unit-III Investigation of crime scene, recording and forensic post-mortem examination.	4
4	Unit - IV	4

	Determination time of death	
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7. Title of the course: PATHOLOGY AND MEDICINE. OF NON-HUMAN PRIMATE AND REPTILIAN DISEASES

Semester: I/III

Course No.: WHM 607(2+1) Theory:

S. No.	Title of the lecture	No. of lecture
1	Unit – I Important diseases, occurrence, principles, concepts and significance of diseases and their treatment in wildlife.	3
2	Unit- II Bacterial Diseases- Pseudomas, Salmonella, Serratia, Pasteurella, Erysipelothrix, Listeria, Streptococcus, Tuberculosis, Dermatophius Mycoplasma, Leptospira, Haemonphilusinfluenze, Compylobacterjejuni, Shigella spp, E. coli infection	7
3	Unit- III Viral Diseases- Rabies, Kyasanar Forest disease, Ebola virus infection, HIV virus infection, Herpis virus infection, Adenoviorus infection, Pox viridae infection, Iridovirus infection, Calciviridae infection, Rhabdoviridae infection, Picornavirus infection	7
4	Unit IV Parasitic Disease- Ascarids, Pantastomiasis, Coccidiosis, Antentamoeba, Trypanosomiasis, Trichomonas,	7
5	Unit -V Decision making in the development, implementation and evaluation of programmes to control diseases in wildlife.	3
6	Unit -VI Special medicine – Non infectious Environmental- Light quality, temperature, Stress Nutritional- Selenium, Vit. A,B ₁ , C, D,K, Iodine deficiency, Calcium and phosphorous deficiency, protein deficiency	5

Practical:

S. No.	Title of the lecture	No. of lecture
1	Unit I- Handling of Non-human primates and reptiles	2
2	Unit II- Collection, preservation and dispatch of different biological samples from the field and aseptic handling of samples	4
3	Unit III-Field laboratory techniques	4
4	Unit IV-Complete haemogram and serum biochemical profile	3
5	Unit V-Postmortem protocol for non-human primates and reptiles	3

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8. Title of the course: **DISEASE MANAGEMENT OF PET AND WILD BIRDS**

Semester :I

Course No.: WHM 608(1+1)

Theory:

S. No.	Title of the lecture	No. of lecture
1	Unit – I Native Indian birds, classification of birds /wild birds, anatomy and physiology of bird, Normal health parameter of important native wildlife avian species and Enrichment /care of zoo birds and pet birds	3
2	Unit – II Bacterial – Salmenellosis, Colibacillosis, Infectious Coryza, Pasteurellosis, Tuberculosis, limber neck, Psittacosis	3
3	Unit-III - Viral – Raniket Disease, Marek’s Disease, Avian Influenza, Infectious laryotrachitis, Avian Leucosis	3
4	Unit-IV - Mycotic Diseases: Aspergellosis, Aflatoxicosis, Canidiasis, Cryptococosis Protozoan – Trypanosomiasis, Avian Malaria, Coccidiosis	2
5	Unit-IV Helminthes Infection and Nutritional disorders- (Vitamins - Vit. A, D, E, K, B1, B2, B6 Panthothenic acid, Biotin, Choline, Folic Acid, B ₁₂ , Vit. C deficienc Mineral deficiencies - Phosphorus, Magnesium, Calcitonin, Sodium, Potassium, Manganese, Zinc, Iron, Copper, Selenium, Chromium, Silicon, iodine deficiency)	1
6	Unit-V - Zoonotic disease of birds and management – like Psittacosis, Salmonellosis, Collibacillosis, Tuberculosis, Ranikheth, Avian influenza, Cryptococosis etc	2
7	Unit -VI - Decision making in the development, implementation and evaluation of programmes to control diseases in wildlife. Study of migration patterns of native species of wild birds.	2

Practical:

S. No.	Title of the lecture	No. of lecture
1	Unit - I Handling and identification of birds	4
2	Unit – II Dispension of drug, contraindications, oral rehydration, immobilization	4
3	Unit – III Collection of blood from wild birds	3
4	Unit – IV Feeding of birds, management of sick birds	5

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9. Title of the course: **NECROPSY PROCEDURES AND CORRELATED PATHOLOGY**

Semester: I/II

Course No.: WHM 609(0+3)

Practical:

S. No.	Title of the lecture	No. of lecture
1	Unit - I Postmortem techniques of major species of wild animals and birds	12
2	Unit - II Identification and understanding of macroscopic and microscopic lesions of pathological conditions, proper collection of tissues from animals	10
3	Unit - III Preparation of different types of fixatives, dehydration, clearing, paraffin embedding, section cutting, staining with H & E and other special staining techniques	14
4	Unit - IV Preparation of PM record and correlation of gross and microscopic pathology of samples collected. Minimum 25 post-mortem examination	12

10. Title of the course: **COMPUTER APPLICATIONS IN WILDLIFE SCIENCE**

Semester : I

Course No.: WHM 610(0+1)

Practical:

S. No.	Title of the lecture	No. of lecture
1	Unit -I Introduction to computer	2
2	Unit -II Introduction to windows 2000, XP, MS-OFFICE, application of computers in publications and e-mail.	5
3	Unit -III Information retrieval through Internet. Data Source, Storage and retrieval.	4
4	Unit -IV Orientation to satellite controlled radio telemetry for ecological studies of wild animals.	5

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11. Title of the course: **NUTRITIONAL MANAGEMENT IN CAPTIVITY**

Semester :I/IICourse No.: WHM 611(1+1)

Theory:

S. No.	Title of the lecture	No. of lecture
1	Unit – I Feeding practices adopted in different class 'A' zoos of India for big cats, small carnivores, small herbivores, omnivores, elephant and non human primates.	5
2	Unit -II Feeding practices in of crocodilians, snakes and turtle.	5
3	Unit-III Nutritional diseases –Vit.A, D, E,K,B ₁ ,B ₂ ,B ₆ Panthenic acid, Biotin , Choline, Folic Acid, B ₁₂ ,C deficiency .Minerals, Phosphorus, Magnesium, Calcitonin, Sodium, Potassium, Manganese, Zinc, Iron, Copper, Selenium, Chromium, Silicon, iodine deficiency Metabolic diseases – Abdominal rupture, senility, shock , Fibrous osteodystrophy, Osteomalacia, Rickets, Osteoporosis or juvenile osteoporosis, Osteogenesis, imperfect, Cage paralysis, Bone atrophy or paper, bone disease, Osteitis fibrosa cystic and gout	7

Practical:

S. No.	Title of the lecture	No. of lecture
1	Unit -I Visit to different zoos	6
2	Unit -II orientation and participation in daily management activities routine including feeding and watering of different species of animals	10
