Syllabus & Regulations

for

B.V.Sc & A.H. Degree Programme

2016-17 onwards

2016.77.28
Syllabus, Academic Rules and Regulations

B.V.Sc & A.H. Degree Programme
(Subject to Approval by the Pondicherry University)

Rajiv Gandhi Institute of Veterinary Education and Research
(Wholly funded by the Government of Puducherry)
Kurumbapet, Puducherry-605 009
2016
F. No. 12-5/2015-VCI.—In exercise of the powers conferred by sub-section (1) of section 66 read with sub-section (1) of section 22 and clause (b) of sub-section (1) of section 21 of the Indian Veterinary Council Act, 1984 (52 of 1984) and in supersession of the Veterinary Council of India – Minimum Standards of Veterinary Education – Degree Course (B.V.Sc. & A.H.) Regulations, 2008, the Veterinary Council of India, with the previous approval of the Central Government hereby makes the following regulations, namely:-

PART I
PRELIMINARY

1. Short title and commencement -
(1) These regulations may be called the Veterinary Council of India Minimum Standards of Veterinary Education- (Bachelor of Veterinary Science and Animal Husbandry - Degree Course) Regulations, 2016.

(2) Provided that any increase in the annual admission may be made after seeking the permission of the Council and may not be done unilaterally by the University. Such increase shall be allowed subject to proportionate increase in facilities and manpower as provided under these Regulations and verification by the Council as per Section 19 of the IVC Act.

(3) They shall come into force on the date of their publication in the Official Gazette.

2. Definitions – (1) In these regulations, unless the context otherwise requires,-
(a) “Act” means the Indian Veterinary Council Act, 1984 (52 of 1984);

(b) “Course” means teaching units of a subject to be covered within a professional year as prescribed in the syllabus of a department;

(c) “Credit Hour” means the weekly unit of work recognised for any particular course as per the course catalogue issued by the University. A lecture class of one hour per week shall be counted as one credit whereas a practical class of two hours duration and a working period of three hours in the Veterinary Clinical Complex (VCC) and Livestock Farm Complex (LFC) per week shall count as one credit.

(d) “Degree Course” means the course of study in Veterinary Science, namely Bachelor of Veterinary Science and Animal Husbandry (B.V.Sc. and A.H.);

(e) “First Schedule” and “Second Schedule” means the First Schedule and Second Schedule respectively appended to the Act;

(f) “Guidelines or Instructions” means the guidelines or instructions issued by the Veterinary Council of India from time to time for uniform implementation of these regulations;

(g) “Inspector” means the Veterinary Inspector appointed under sub-section (1) of section 19 of the Act;

(h) “President” means the President of the Veterinary Council of India;
(i) “qualifying examination” means Higher Secondary (10+2) examination or equivalent conducted by a State Board of Education or Central Board of Education;

(j) “Professional Year” means a period consisting of minimum two hundred and ten instructional days, excluding annual examination days except fourth professional year which consists of 315 instructional days;

(k) “Secretary” means the Secretary of the Veterinary Council of India appointed under section 11 of the Act;

(l) “Syllabus” and “curriculum” means the syllabus and curriculum for courses of study as specified by the Veterinary Council of India;

(m) “teaching experience” means the experience of teaching in the subject concerned in a recognised veterinary college or provisionally recognised veterinary college or recognised veterinary university after obtaining post graduate qualification in the concerned subject;

(n) “Veterinary hospital or institution” means the Veterinary Clinical Complex of the college or Veterinary hospital of State Government or private hospital recognised by the University and duly approved by Veterinary Council of India which shall have the basic infrastructure such as diagnostic lab, X-ray, Ultrasonographic facilities etc. or institution relevant to livestock health, reproduction and diagnostics by whatever name called;

(o) “Visitor” means a Visitor appointed under sub-section (1) of section 20 of the Act;

(p) “recognised veterinary college” means any veterinary college or institution either a constituent College of the University or affiliated to a University and engaged in imparting teaching of Bachelor of Veterinary Science and Animal Husbandry degree course and recognised by the Central Government on the recommendation of Veterinary Council of India after inclusion in the First Schedule for the Act under overall administrative control of the Dean or Principal or Associate Dean;

(q) “University” means any university or other institution within or outside India which grants degrees and post graduate diplomas.

(r) “provisionally recognised veterinary college” means a newly established veterinary college where admission shall be allowed by the Veterinary Council of India on annual basis after conducting inspection and subject to fulfillment of Minimum Standards of Veterinary Education regulations 2016.

(2) Words and expressions used herein and not defined but are defined in the Act shall have the same meaning as assigned to them in the Act.

**PART II**

**COURSE OF STUDY**

**Degree Course**- (1) A degree course of Bachelor of Veterinary Science and Animal Husbandry shall comprise of a course of study consisting of curriculum and syllabus specified in Part IV of these regulations spread over five and half complete professional years including a compulsory internship of “one year” duration undertaken after successful completion of all credits as prescribed in the syllabus.

(2) During the course of study there shall be training in veterinary clinical complex or state veterinary hospital, private veterinary hospital, animal farm or livestock farm complex as part of the course.
4. **Duration of professional year**-

(1) First professional year of Bachelor of Veterinary Science and Animal Husbandry classes shall commence latest by 1st September of every year.

(2) The annual examination shall be conducted prior to summer vacation for the year.

(3) Each professional year shall cover at least two hundred ten days of instruction excluding time spent for annual examinations.

5. **Procedure to be adopted for imparting training in the veterinary hospitals or institutions and internship with suitable adjustment at**-

(1) The Veterinary Clinical Complex shall be a separate department in every veterinary college under the independent charge of a Faculty Member of the rank of a Professor with specialisation in any of the clinical subjects and shall operate round the clock.

(2) Veterinary Clinical Complex shall be recognised only if it has an average minimum of 500 outdoor cases and 10 indoor cases in a month.

(3) In case the Veterinary Clinical Complex does not have requisite number of out-patient and in-patient cases as provided in sub-regulation(2) above, the University or College shall set up outreach facilities not beyond twenty km radius of the College to fulfil the above minimum requirements. Such outreach clinical facility shall have the entire infrastructure as prescribed for a veterinary clinical complex under these regulations.

(4) The attached veterinary hospitals shall have properly built in-door wards, client accommodation, emergency service and the necessary facilities to conduct and demonstrate or train all medical, surgical and gynaecological cases and separate “in Health” care facilities like artificial insemination, pregnancy diagnosis, animal birth control, health verification tests, prophylaxis etc.

(5) There shall be residential accommodation for clinical and hospital staff and suitable accommodation for students on emergency or night duties and cafeteria or canteen for staff, students and clients.

(6) All the concerned staff on duty in the Veterinary Clinical Complex or veterinary hospital or both shall be responsible for the treatments and allied public services and shall invariably attend the clinics including emergencies or night duties and on Sundays or any holidays and the staff as well as students shall be properly attired {Apron, Coverall (dangree), etc} and equipped for the performance of clinical duties.

(7) The teaching institutions shall maximally utilise the animal or patient information observing all the time the principles of animal welfare and ethics, and arrange the following namely:-

   (i) the teaching material in the form of clinical cases in sufficient number, variety and species;
   
   (ii) subsidized treatment to encourage larger attendance in teaching veterinary hospitals;
   
   (iii) procure or provide free maintenance to, cases of academic interest or typical cases of teaching value so that students can benefit from them;
   
   (iv) in the case of death or euthanasia detailed necropsy be demonstrated and specimens preserved;
   
   (v) maintenance of clinical data registers;
(8) The Livestock Farm Complex shall be a separate department in every veterinary college under the independent charge of a faculty member of the rank of a Professor of animal production departments preferably with specialization in Livestock Production Management subject and shall operate twenty four hours and the farm complex shall be for teaching in rearing of livestock species and poultry with the following facilities namely:

(i) housing, feeding, breeding and management of large and small ruminant, piggery, poultry and animals of regional interest;
(ii) record keeping;
(iii) storage facilities for feed and fodder;
(iv) production facilities for fodder crops;
(v) suitable housing for managerial and technical staff;

(9) In case other facilities like Gaushalas or community farms are utilised, these shall be in addition to the above requirements but shall not serve as a substitute

(10) Being a twenty four hours service there shall be suitable accommodation for staff and students on duties.

(11) All the concerned staff on duty in the Livestock Farm Complex shall be responsible for management including emergencies of the animals in the livestock Farm and they shall arrange and supervise the routine managemental practices from time to time and shall maintain records for the same and shall also be responsible for production activity in each of the units

PART III

ADMISSION TO THE BACHELOR OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY DEGREE COURSE

6. Criteria for admission - A candidate shall not be admitted to Bachelor of Veterinary Science and Animal Husbandry degree course unless,

(a) he or she has completed the minimum age of 17 years and the maximum age of 25 years on or before the 31st December of that year of his or her admission to the 1st year of Bachelor of Veterinary Science and Animal Husbandry course; and there shall be relaxation of maximum age by five years for Scheduled Caste or Scheduled Tribe or Other Backward Class candidates.

(b) he or she has passed the qualifying examination as defined under these regulations with the subjects of Physics, Chemistry, Biology or Biotechnology and English (as a core course) and obtained marks as specified under regulations (7) or an examination equivalent to intermediate science examination of an Indian University or Board recognised by the Association of Indian Universities taking Physics, Chemistry and Biology including a practical test in each of these subjects and English.

7. Selection of students – (1) The selection of students for admission to Bachelor of Veterinary Science and Animal Husbandry Degree Course in Government or Private Colleges shall only be on the basis of merit through a competitive entrance examination conducted by University or State Government or Veterinary Council of India to achieve a uniform evaluation, as there may be variation among students at qualifying examinations conducted by different agencies and reservation policy shall be as per Government of India for Veterinary Council of India seats and for States as per their reservation policy.
(2) To be eligible for competitive entrance examination, a candidate shall have to pass any of the qualifying examinations as enumerated under the head, “Admission to Bachelor of Veterinary Science and Animal Husbandry Degree Course” specified under regulation 6.

(3) A candidate under General Category for admission to the Bachelor of Veterinary Science and Animal Husbandry degree course shall have to qualify in each of the subjects of English, Physics, Chemistry and Biology, and obtained 50% marks in aggregate of these subjects, at the qualifying examination and admission of students to B.V.Sc. and A.H. degree course shall be made only on the basis of his or her merit in the competitive entrance examination and no other merit or weightage shall be considered for admission to Bachelor of Veterinary Science and Animal Husbandry degree course.

(4) In respect of candidates belonging to the Scheduled Castes or the Scheduled Tribes or other special category of students as specified by the Government from time to time, marks required for admission shall be 5% less than that prescribed for general category i.e 47.5% and where the seats reserved for the Scheduled Caste and the Scheduled Tribes students in any State cannot be filled for want of requisite number of candidates fulfilling the minimum requirement prescribed from that State, then such vacancies shall be filled up on all India basis with students belonging to the Scheduled Castes and Scheduled Tribes obtaining not less than the minimum prescribed pass percentage.

(5) The students who are educated abroad seeking admission in veterinary colleges in India should have passed the subjects of Physics, Chemistry, Biology or Biotechnology and English up to the 12th Standard level with 50% marks in aggregate of these subjects.

(6) Sponsored candidates shall have to qualify the admission procedures as laid down for the students under general category.

(7) Admission of candidates to Bachelor of Veterinary Science and Animal Husbandry degree course under bilateral exchange programme shall be regulated by Veterinary Council of India or on recommendation of Government of India.

(8) 15% of the total number of seats of each recognised veterinary college which is included in the First Schedule of the Act shall be reserved and filled on all India basis through Common Entrance Examination and seats for the candidates belonging to Schedule Caste or Schedule Tribes or Physically handicapped or Other backward classes against said 15% quota of Veterinary Council of India shall be reserved to be filled up as per Government of India Policy.

(9) The candidates selected through this examination shall be admitted in various recognised veterinary colleges as per the eligibility criteria prescribed in these regulations only and the last date for reporting of these candidates to the allotted University or Veterinary Institution shall be 15th September of that year irrespective of the closing date of admission of that University or Veterinary Institution for that year, if earlier, the vacant seats may be filled by the veterinary college or university by 30th September which shall be the final cut-off date for the admission and thereafter no admission shall be made.
A candidate shall not be allowed admission to Bachelor of Veterinary Science and Animal Husbandry degree course including those admitted under 15% reserved quota of Veterinary Council of India if he or she suffers the following disabilities, namely:-:

(a) disability of total body including disability of chestorspine more than 50%,
(b) disability of lower limb of more than 50%,
(c) disability of upper limb,
(d) visually handicapped candidates and those with hearing disability,
(e) candidates with progressive diseases like myopathies etc.
(f) disabilities which otherwise would interfere in the performance of the duties of a veterinarian.

The disability shall be certified by a duly constituted and Government authorized Medical Board comprising of at least three specialists out of which two shall be of the specialty concerned and the candidate has to present him or her-self before the Medical Board and the last valid disability certificate of the candidate from a Medical Board shall not be more than three months old from the date of submitting his or her certificate for disabled candidates.

After the final admissions, each Veterinary college shall submit the details of the students admitted in the first professional of BVSc and AH programme and similarly the list of students who pass out shall also be submitted to the Veterinary Council of India.

PART IV

VETERINARY CURRICULUM – STRUCTURING AND ORGANIZATION OF COURSE CURRICULUM

8. Veterinary Curriculum – (1) The following shall be the veterinary curriculum, namely:-

(a) (i) Core Courses; and

(ii) Internship including Entrepreneurial Training;

(b) the curriculum shall provide adequate emphasis on cultivating logical and scientific habits of thought, clarity of expression, independence of judgment, ability to collect information and to correlate them and develop habits of self-education;

(c) medium of instruction for B.V.Sc. and A.H. degree course shall be in English;

(d) practical training at Livestock Farm Complex or Clinical practice shall be organised in small groups of 5 to 10 students so that each teacher can give personal attention to each student with a view to improve his or her skill and competence in handling of the patients and each practical batch for a course shall be preferably not more than twenty students;

(e) efforts shall be made to encourage students to participate in group discussions and seminars to enable them to develop personality, character expression and other abilities which are necessary for a veterinary graduate to function either in solo practice or as a team member when he or she begins his or her independent professional career and an appropriate time slot for this activity be provided in the student study time table.
9. Subjects to be covered in the Bachelor of Veterinary Science and Animal Husbandry Degree Course –

The following shall be the subjects for B.V.Sc. and A.H. degree course, namely:

(a) Veterinary Anatomy,
(b) Veterinary Physiology,
(c) Veterinary Biochemistry,
(d) Veterinary Pharmacology and Toxicology,
(e) Veterinary Parasitology,
(f) Veterinary Microbiology,
(g) Veterinary Pathology,
(h) Veterinary Public Health and Epidemiology,
(i) Animal Nutrition,
(j) Animal Genetics and Breeding,
(k) Livestock Production Management,
(l) Livestock Products Technology,
(m) Veterinary Gynaecology and Obstetrics,
(n) Veterinary Surgery and Radiology,
(o) Veterinary Medicine,
(p) Veterinary and Animal Husbandry Extension Education,
(q) Veterinary Clinical Practices,
(r) Livestock Farm Practices.

10. Migration or Transfer of Student – (1) Student studying in a recognised veterinary college which is included in the First Schedule of the Act may be allowed to migrate or be transferred to another recognised veterinary college under another or same University.

(2) The migration or transfer may be allowed by the university concerned after passing 1st year of Bachelor of Veterinary Science and Animal Husbandry degree course within one month of the start of academic session of 2nd year of the receiving College or University.

(3) The number of students migrating or transferring from one veterinary college to another veterinary college during the period of one academic year will be kept to the maximum limit of 5% of the intake capacity of each of the veterinary colleges in one year.

(4) The cases not covered under sub regulations, (1) to (3) may be referred to the Veterinary Council of India for consideration on merits.

(5) An intimation about the admission of migrated or transferred students into any veterinary college shall be sent to the Veterinary Council of India by the respective Institution.

11. Syllabus. – (1) The details of syllabus comprising of 81 credits (equivalent to 179 credit hrs. as per semester system) are the minimum requirement for a programme leading to Bachelor of Veterinary Science and Animal Husbandry degree and the summary of the distribution of courses shall be as follows:-
<table>
<thead>
<tr>
<th>Professional Year</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>First (one year)</td>
<td>12</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>Second (one year)</td>
<td>15</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>Third (one year)</td>
<td>15</td>
<td>9</td>
<td>24</td>
</tr>
<tr>
<td>Fourth (one and a half year)</td>
<td>8</td>
<td>9</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>31</td>
<td>81</td>
</tr>
</tbody>
</table>

(Equivalent to 179 credit hours as per Semester system)

(2) In addition to the Core Courses above, a student shall have to successfully complete the Internship including Enterpreneurial Training as has been specified in sub-regulation (1) of regulation 8 for the award of Bachelor of Veterinary Science and Animal Husbandry degree.

(3) Remount Veterinary Squadron or National Cadet Crop or Equestrian or National Social Service or Sports and games shall be non-credit (0+1) training programmes any of which for all the Professional Years shall be compulsory (except fourth) for the award of Bachelor of Veterinary Science and Animal Husbandry degree and the performance of the students in these training programmes shall be assessed and graded as ‘Satisfactory’ or ‘Unsatisfactory’ and student has to obtain ‘Satisfactory’ grading for successful completion of course requirements.

(4) The Syllabus prescribed in regulation 11 is the minimum instructional syllabus and is illustrative of the course content for teaching different courses at the veterinary colleges in the country for Bachelor of Veterinary Science and Animal Husbandry degree programme:

Provided that there is scope for flexibility of addition of topics or courses in the programme as per need or regional or institutional demand from time to time and such changes shall be non-violative and commensurate to the basic structure, curriculum and infrastructure prescribed in these regulations.

12. Internship. – (1) Every student of Bachelor of Veterinary Science and Animal Husbandry degree course shall be required after passing the fourth professional examination to undergo compulsory rotating internship to the satisfaction of the University for a minimum period of twelve calendar months so as to be eligible for the award of the degree of Bachelor of Veterinary Science and Animal Husbandry and full registration with the council.

(2) Compulsory rotating internship shall include a full time training in veterinary and animal husbandry services (including emergencies and night duties, Sundays and holidays) and the intern shall devote whole time to the training and shall not be allowed to accept a whole time or part time appointment paid or otherwise.

(3) Internship shall be undertaken only after completion of all credit requirements of veterinary curriculum including Remount Veterinary Squadron or National Cadet Crop or Equestrian or National Social Service or Sports and games as applicable under these regulations.

(4) The university shall issue a provisional course completion certificate of having passed all the professional examinations and having successfully completed prescribed course work.
The State or Union territory Veterinary Council shall grant provisional registration to the candidate on production of provisional Bachelor of Veterinary Science and Animal Husbandry course completion certificate and the provisional registration shall be valid for a minimum period of twelve months and maximum of sixteen months.

After provisional registration with the State or Union Territory Veterinary Council, the candidate shall register for internship of twelve calendar months.

Interns shall be actively involved in rendering veterinary service under the supervision of an experienced teacher.

The intern shall assist the teacher or incharge in all activities of the units they are posted in.

During the period of internship the intern shall be provided accommodation or lodging and paid consolidated remuneration in the form of internship allowance as may be decided by the University or Institution from time to time.

The intern shall be entitled for fifteen days casual leave and the leave cannot be claimed as a matter of right until and unless the sanctioning authority sanctions it and an intern will fully absents from the training programme even if for part of a day or during off hours duty (including Sundays and holidays he or she may be treated absent for that day and the candidate shall be required to undergo training for the additional days in lieu of the absence period and internship allowance shall not be paid for these additional days.

The internship programme shall be monitored by a Committee constituted by the Dean and the Committee shall comprise of Dean or Representative or nominee of the Vice Chancellor, incharge of Veterinary Clinical Complex, incharge of Livestock Farm Complex and Associate Professor (Internship) as members and this Committee shall monitor effective implementation of the internship training programme from time to time and shall be required to inspect the internship programme at different intervals of time randomly.

In case of unsatisfactory work or performance or shortage of attendance or both the period of compulsory rotating internship shall be extended by two months and the student shall be reevaluated, if again found unsatisfactory or is unable to secure 50 marks, he shall be given one more chance after another two months and if he still is found unsatisfactory due to any reason, the intern has to re-register afresh for internship programme for entire twelve calendar months including registration with the State or Union Territory Veterinary Council.

Internship allowance shall be paid only for twelve calendar months and no internship allowance shall be paid for the period of absence or unsatisfactory performance or extended period or re-registration period.

The compulsory rotating internship shall be in the following areas, namely:-

(i) posting in Veterinary Clinical Complex for Clinical training covering veterinary medicine, surgery and radiology, gynaecology and obstetrics, clinical emergencies, indoor ward care, lab diagnosis, ambulatory, hospital management, record keeping etc;
(ii) posting at Veterinary Clinical Complex of veterinary college of other state in India with provision of rent free accommodation;

(iii) posting in any four of Zoo or wild life centre or eNational Parks, Meat Plant or Abattoirs, Milk Plants, Poultry Farms, Field Hospital, Animal Welfare Organization, Vaccine Institute, Remount Veterinary Corps, Pharmaceutical, Feed Industry for hands on training in each establishment;

(iv) entrepreneurial training and management covering farm routines of cattle and buffalo farms, piggery or rabbitary, sheep and goat farms, and equine or camel unit etc. Poultry production and management covering layer and broiler production, hatchery and chick management and learning farm practices like record keeping and other related activities;

(v) each intern shall submit a Project Report on completion of entrepreneurial training and this training is aimed at developing entrepreneurial skill for self-employment and the university or college shall provide interest free loans, technical support and infrastructure for these activities. Inputs, day-to-day work and financial accounting shall be undertaken by the students;

(vi) the profits, if any, shall be kept by the students, provided, in case of loss, the Dean of the college through the Entrepreneurial Committee consisting of four faculty members (at least one subject matter specialist) may evaluate the reasons of such loss and provide compensation in case it is found that the loss has been inadvertent;

(vii) the Incharge or nominee of each posting shall regulate the training of such interns and submit the evaluation report of each intern out of 20 marks which shall be accounted at the time of final evaluation;

(viii) the remaining days shall be utilised for the final assessment of interns as prescribed in these regulation, with the objective of having achieved following core competency namely:-

(a) restraint of cow, sheep, horse, dog and pig. Haltering, snaring, muzzling, tail switch, bandaging of horse for exercise and stable bandaging;

(b) animal identification, dentition and ageing of animals;

(c) housing layout or requirements of livestock and poultry;

(d) computation of ration of livestock of different breeds and age groups in health and disease;

(e) fodder management and interpretation of feed quality evaluation;

(f) physical evaluation of livestock health parameters (auscultation, percussion, recording of temperature, pulse, heart rate, respiration rate etc.);

(g) recording and interpretation of cardiovascular response;

(h) testing of milk and milk products for quality, clean milk production;

(i) carcass quality evaluation (ante-mortem & post-mortem examination);

(j) specific diagnostic tests for zoonotic diseases;

(k) sample collection, handling and dispatch of biological materials for laboratory examination;

(l) staining techniques for routine clinico-pathological examinations;
relating post-mortem lesions to major livestock diseases;
haematological evaluation (total leukocyte count, differential leukocyte count, haemoglobin, packed cell volume, erythrocyte sedimentation rate etc.) and interpretation;
tests and their interpretation for haemoproteozoon diseases;
body fluids collection, examination and interpretation as an aid to diagnosis;
urine evaluation procedures and interpretation as indicators for diagnosis of diseases;
faecal examination procedures and interpretation;
examination of skin scrapings and interpretation;
interpretation of blood chemistry profile in diseases;
deworming procedures and doses for different species of animals or birds;
managing an outbreak of infectious or contagious disease;
approach to diagnosis of a given disease condition;
pre-anesthetic administration and induction, maintenance of general anaesthesia and dealing with anesthetic emergencies;
local anaesthetic administration;
nerve blocks- sites, functional application;
suture material, suture pattern and tying knots;
common surgical procedures including dehorning, docking, caesarian section, ovariohysterectomy, castration, rumenotomy;
application of plaster castorsplint for fracture immobilization and other bandaging procedure in large and small animals;
soundness in horses;
rectal examination–palpation of pelvic or abdominal organs in cattle or horses or buffaloes,
detection of oestrus, artificial insemination, pregnancy diagnosis;
management of vaginal or uterine prolapse and dystocia;
andrological examination of bull, handling, preservation and evaluation of semen;
vaccination procedures , vaccination schedules and vaccine types for different diseases;
handling of radiograph, interpretation of a given radiograph of large and small animals;
client management;
managing a clinical practice, ambulatory van, transporting a sick animal requirements, etc.;
dosage regimens of important drugs;
drug administration techniques in different species of animals-oral, parenteral, rectal, intra-peritoneal and intra-uterine;
identification of major livestock or poultry breeds;
measuring climatic parameters and their interpretation;
communication technology tools.
(15) Details of day to day work, posting and duration needs to be worked out by the Veterinary Institution as per its needs and infrastructure facilities and the activities of interns shall be regulated by an Associate Professor (Internship) posted in Veterinary Clinical Complex and Assistant Professor (Internship and Entrepreneurship) Livestock Farm Complex.

(16) The intern shall have the following functions, responsibilities and duties namely:-
   (i) participation with clinical faculty in the hospital practice;
   (ii) to share the emergency and night duties on rotation in the large and small animal hospitals including Sundays and holidays;
   (iii) participation with staff of the place of posting in Veterinary Practice, Production or Technology;
   (iv) hands-on diagnostic and treatment procedures for hospitalized cases under the supervision of the attending veterinarian;
   (v) to administer primary care to emergency cases and participate in service such as anesthesia, radiology, ultrasonography, endoscopy, laboratory and diagnostic procedures.

   Medicine, Gynaecology and Surgery rounds are held periodically allowing the interns to present cases and participate in topic discussion.

(17) The training shall be supplemented by fortnightly sessions of clinical conference, farm operation and data analysis, preparation of feasibility reports, project report, campaigns or discussions in clinical training, farm training and technology.

(18) The intern shall maintain a log book of day to day work which shall be verified and certified by the supervisor under whom he or she works and in addition, the interns shall prepare a brief project report on the basis of his or her case study or case analysis, survey reports etc. and shall be based on his or her own study during the internship and such reports be supervised by more than one teacher, if required and the interns shall present such report in seminar organised for the purpose.

(19) The assessment of each intern shall be based upon the evaluation of log book or project report, his or her performance reports from all the minimum prescribed training postings, entrepreneurial output, clinical case reports and their presentation, viva and comprehensive examination in core competence in veterinary skills through a written test by an Evaluation Committee comprising of the faculty representing the concerned departments appointed by the Dean for this purpose and the distribution of marks for various components of assessment shall be as under, namely:-

<table>
<thead>
<tr>
<th>Component</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log book or Project Report:</td>
<td>10</td>
</tr>
<tr>
<td>Performance in different postings:</td>
<td>20</td>
</tr>
<tr>
<td>Entrepreneurial output:</td>
<td>20</td>
</tr>
<tr>
<td>Case Reports or Presentation:</td>
<td>10</td>
</tr>
<tr>
<td>Written test:</td>
<td>30</td>
</tr>
<tr>
<td>Viva:</td>
<td>10</td>
</tr>
<tr>
<td>Total:</td>
<td>100</td>
</tr>
</tbody>
</table>
(20) The minimum pass marks in internship assessment shall be 50 out of 100.

(21) After successful completion of Internship, the Dean shall then issue the certificate of satisfactory completion of internship training as prescribed by the Veterinary Council of India.

(22) A candidate shall become eligible for registration with State or Union Territory Veterinary Council only on the award of the B.V.Sc and A.H. degree or production of a provisional degree certificate by the University.

13. **Examination and Evaluation.** – (1) It shall be the responsibility of the teacher(s) or instructor(s) to ensure that the topics to be covered in the theory and practical in each course shall be recorded through a lecture or practical schedule and distributed to the students at the beginning of each course and the Head of the Department or Dean shall ensure that the schedule is adhered to and alternate arrangements are made to cover up the loss in case of any eventualities of unavoidable reasons that lead to non-adherence of the above schedule.

(2) Work distribution chart of each teacher shall be available with Dean’s office for inspection of the Council and in each subject, professors and senior teachers shall be actively involved in teaching, especially in conducting practical for degree course.

(3) The examination shall be to assess whether the student has been able to achieve a level of competence and for academic assessment, evaluation of practical aspects of the curriculum shall receive much greater emphasis leading to separate examinations and requiring the student to secure a minimum of 50% marks, in theory as well as in practical, in each such examination.

(4) The weightage of theory and practical shall be in the ratio of 60:40 respectively.

(5) The distribution of marks for objective and subjective questions in each subject shall be in the ratio of 40:60 respectively in annual examinations provided the format of question paper in internal assessment shall be as per the choice of instructor(s).

(6) The schedule of examination during Bachelor of Veterinary Science and Animal Husbandry course shall consist of internal assessment and annual examinations as detailed below, namely:

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<table>
<thead>
<tr>
<th>Internal Assessment</th>
<th>Course Coverage</th>
<th>Max. Marks</th>
<th>Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>30%</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>Second</td>
<td>60%</td>
<td>40</td>
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There shall be four professional examinations- one each after 1\textsuperscript{st}, 2\textsuperscript{nd}, and 3\textsuperscript{rd} year, and the fourth after one and half year and these professional examinations shall have only the theory component with external system and the practical component shall be dealt with internally. Annual professional examination shall be held after the completion of 100% course content in each subject and the result of the best of two internal assessments shall be accounted for.

The examination for Livestock Farm Complex and Veterinary Clinical Complex shall be conducted twice a year i.e. first practical exam after completion of 50% syllabus and the second one, when the course is completed but the second exam shall comprise of entire syllabus.

The evaluation of answer books of internal examinations shall be done by the concerned teacher(s) whereas evaluation of answer books of annual theory examinations shall be done by the external examiner(s).

The practical examinations shall be conducted by a Board of Examiners consisting of concerned Head of the Department, teacher(s) and a representative of the Dean and the teachers while evaluating practical, shall take into account the followings, namely:-

(i) a record or log book maintained by each student as practical records;
(ii) written test or observation and recording of the skill with which each student executes the practical;
(iii) assessment of the comprehensive skill and knowledge of each student through an oral examination (viva-voce).

The answer-books of internal assessment shall be shown to students and the records of internal assessment as well as that of annual practical examination shall be submitted to Controller of Examination.

The practical manuals shall be prepared by the respective departments for each subject.

The duration of internal assessment shall be at least one hour whereas the duration of annual theory examination shall be three hours and one month prior to the commencement of annual examinations the best of two internal assessment marks shall be submitted by the instructor through the Head to the Controller of Examinations or Registrar.

The annual theory examination(s) shall be conducted by inviting the question paper from appointed paper setter(s) and a paper setter shall be provided the courses and syllabus prescribed by the Veterinary Council of India including detailed course outline and the paper setter shall be requested to prepare two sets of question subjects, each for main examination and compartment examination (if any).

The internal assessment shall be conducted by the concerned instructor(s) during free period without affecting the teaching schedule provided the annual examinations shall be held on such dates, time and places as the university may determine and shall be completed in time so that the results are announced before the onset of the ensuing academic year.

The schedule of annual examinations shall be adhered to strictly and no re-examination shall be allowed in events of students’ strike, boycott, walkouts, medical grounds or what-so-ever may be the reason.
(17) The compartment examination shall be conducted within twenty calendar days of subsequent year registration: Provided that a candidate may be allowed to provisionally sit in the next class provided he or she has failed only in two subjects and cannot be promoted to next Bachelor of Veterinary Science and Animal Husbandry class unless he or she has cleared the failed subject(s).

(18) The records of examination shall be made available to the Council, as and when required and the records of assessment may be retained till six months after the conduct of the annual examination.

14. Teachers, Examiners, Paper Setters. – (1) The persons with only basic veterinary qualification, included in Schedules to the Act, registered with a State Veterinary Council and having a Post-graduate Degree in the concerned subject, shall be recruited as teaching faculty in the Veterinary Colleges and preference shall be given to the candidates who have qualified National Eligibility Test conducted by Agricultural Scientist Recruitment Board and in case National Eligibility Test qualified candidates are not available they shall qualify National Eligibility Test prior to their promotion and the College or University may employ Graduate Assistants with BVSc and AH or MVSc degree against the vacant post for a maximum period of two years and not more than one in each department.

(2) The post of Dean and Head of Department in a Veterinary College shall be filled up only with a teacher with basic veterinary qualification and the teaching staff in a veterinary college shall be whole-time teacher and shall be entitled for Non-Practicing Allowance (NPA).

(3) A person possessing qualification included in the First or Second Schedule to the Act shall be generally appointed as examiner or paper setter for the conduct of a professional examination for the Bachelor of Veterinary Science and Animal Husbandry course:

Provided that a person without the qualifications mentioned above may also be appointed examiner in his or her concerned subject provided he or she possesses the doctorate degree in that subject and a minimum three years under graduate teaching experience.

Provided, further that -

(a) no such person shall be appointed as an external examiner unless he or she has at least three year’s teaching experience;

(b) no person below the rank of Lecturer or Assistant Professor or equivalent shall be appointed as internal examiner;

(c) no person shall be appointed as an external examiner in any para clinical or clinical subject unless he or she possesses a recognised veterinary qualification and holds a postgraduate degree and teaching experience in the subject concerned.

(d) persons working in Government or Semi Government or similar organisations may also be considered for appointment as external examiners provided they possess qualification and experience as laid down above.

(e) local person(s) shall normally not be appointed as paper setter(s) or external examiner(s), provided, under exceptional circumstances or unavoidable exigencies arising at the time of examination (like not arrival of appointed examiner or non-receipt of question paper from paper setter etc.), the University may appoint any qualified person for the purpose to avoid postponement or cancellation
15. **Attendance.** – (1) The required condition of attendance shall not be deemed to have been satisfied in respect of the subject, unless the student has ordinarily attended all the scheduled theory and practical classes, provided, the minimum requirement of attendance shall not be less than 75% of scheduled theory and practical separately with relaxation of twenty working days for NCC or NSS, Co-curricular activities and medical ground and for the course of 0+1 credit, the relaxation shall be of only seven days.

(2) A candidate having attendance below 75% in a subject shall not be eligible to appear in the annual examination of that subject.

(3) The percentage of attendance of a student in a subject shall be computed on the basis of the total number of theory and practical classes scheduled between the date of commencement of instructions and date of closing of instructions irrespective of the date of registration, provided, for the students who are reverted back owing to failure in the compartment examination, the attendance shall be counted from the date of declaration of result of compartment examination and the date of closing of instructions and the attendance for the First year shall be counted from the date of registration.

16. **Promotion.** – (1) Promotion of a student in a professional year shall be decided only on the basis of aggregate marks of internal assessment and annual examinations.

(2) A student shall be promoted to next higher professional class only if he or she has passed in all the subjects of his or her class by obtaining at least 50% marks in theory (internal and external combined) and practical separately.

(3) A student should secure OGPA of 5.00 out of 10.00 at the end of degree programme to be eligible to get Bachelor of Veterinary Science and Animal Husbandry degree.

(4) A student may also be allowed provisional promotion to next higher class till the declaration of the result of the compartment examination, provided the provisional promotion shall be subject to clearance in the compartment examination of that or those subject(s) and shall be provisional and if the student fails in the compartment examination, he or she shall stand automatically reverted to the class from where he or she was allowed provisional promotion.

(5) Failed students shall register again for the entire professional class they failed and such students shall have to fulfill all requirements of the class afresh.

(6) A student failing in the annual examination for three consecutive years in a professional year of Bachelor of Veterinary Science and Animal Husbandry degree programme shall be finally dropped automatically from the University on account of poor academic performance (except fourth professional year).

(7) In no case, a student shall be allowed to continue his or her Bachelor of Veterinary Science and Animal Husbandry studies beyond Nine academic years (excluding Internship) in a Veterinary College.

17. **Compartmental examination.** – (1) A student failing in a maximum of two subjects only may be allowed to appear in compartment examination for those subject(s) and the compartment examination shall comprise of the annual component of both the theory and practical of the failed subject(s) which shall constitute 40 and 40 percent weightage, respectively, and the marks obtained in internal assessment
of theory shall be considered for the evaluation of compartment examination.

(2) The compartmental examination shall be conducted within twenty calendar days of subsequent year registration and if the student fails in the compartmental examination, he or she shall be reverted back to the original class and the results of such compartment examination shall be declared within ten days after the examination is conducted.

18. Scrutiny of answer papers and rectification of errors. – (1) There shall be a provision of scrutiny of answer book(s).

(2) A student, however, may be allowed to get his or her theory answer book(s) scrutinised, for which, the student shall have to apply to Controller of Examination or Coordinator of examination within three days after the declaration of result and after paying prescribed fee.

(3) The Controller or Coordinator (Examination) shall arrange the scrutiny of answer book(s) by the Screening Committee to be constituted by the Dean.

(4) The scrutiny shall be for re-totaling of the marks, and evaluation of unmarked question(s), if any.

(5) In case, the total marks are found to be incorrect on scrutiny, the same shall be corrected and the result shall be revised accordingly (even if it is towards lower side) and if, any question is found to be unchecked by the examiner, the answer book(s) shall be sent to the Examiner for doing the needful and the result(s) shall be revised accordingly if there occurs any change in the marks.

(6) No representation by the student(s) shall be entertained regarding the outcome of the result after scrutiny.

(7) In case a student on the basis of the result of scrutiny becomes eligible for the compartmental examination, he or she may apply to the concerned authority to appear in the compartment examination on the announced scheduled date and the scheduled date of the compartment examination shall under no circumstances be changed on this account.

(8) The Controller or Coordinator of Examination in consultation with the Dean of the College shall form Committee of three members consisting of Dean of the College as Chairman and two other teaching faculty members to moderate the results obtained at the annual board examination and the Committee shall review the results and recommend the moderation in the event of failure of more than 10% of the student actually appearing in that particular subject and any moderation suggested shall be uniformly applied to all students for that paper(s) without altering the merit of the passed candidates.

(9) Any moderation effected should not involve of enhancing of more than total of 5 marks in a professional year for a particular candidate, and in no case more than 3 marks in one subject and the provisions for moderation of results shall not apply to Compartment Examinations and there shall be no provision for grace marks in any case.

19. Grading. –

(1) Grade Point in a subject shall be the total marks obtained by a student out of 100 divided by 10

(2) Credit Pont in a subject shall be Grade Point multiplied by the credit hours.

(3) Total Credit Points shall be the sum of the credit points secured.
(4) Grade Point Average shall be the sum of the total credit points earned divided by the sum of credit hours.

(5) Overall Grade Point Average shall be the sum of the grand total of credit points earned divided by the grand sum of credit hours.

(6) The corresponding ranking of Overall Grade Point Average with respect to traditional scoring system of division ranking shall be as follows, namely:

- 8.000 and above - First Division with Distinction
- 7.000 - 7.999 - First Division
- 6.000 - 6.999 - Second Division
- 5.000 - 5.999 - Pass

(7) The formats of detailed mark certificate and degree transcript are annexed at Annexure I and II to these regulation.

PART V
COURSES AND COURSE CONTENTS
20. PROFESSIONAL YEAR WISE DISTRIBUTION OF COURSES

(1) FIRST PROFESSIONAL
Veterinary Anatomy 4+3=7
Veterinary Physiology 4+1=5
Livestock Production Management 4+2=6
Total 12+6=18

(2) SECOND PROFESSIONAL
Veterinary Biochemistry 2+1=3
Veterinary Microbiology 3+2=5
Veterinary Pathology 4+2=6
Animal Genetics and Breeding 3+1=4
Animal Nutrition 3+1=4
Total 15+7=22

(3) THIRD PROFESSIONAL
Veterinary Pharmacology and Toxicology 4+1=5
Veterinary Public Health and Epidemiology 3+1=4
Veterinary Parasitology 3+2=5
Livestock Products Technology 2+1=3
Veterinary and Animal Husbandry Extension Education 3+1=4
Veterinary Clinical Practices – I 0+1=1
Livestock Farm Practices 0+2=2
Total 15+9=24

(4) FOURTH PROFESSIONAL
Veterinary Surgery and Radiology 2+1=3
Veterinary Medicine 4+1=5
Veterinary Gynaecology and Obstetrics 2+1=3
Veterinary Clinical Practices –II 0+6=6
Total 8+9=17
21. COURSE CONTENTS

(1) GENERAL REMARKS
Alternate use of animals as model for demonstration shall be encouraged and the computer simulations, Interactive CD-Rom, films, charts and life like models shall be used for better understanding of the subject and the programme to obtain cadavers ethically be established at all veterinary colleges.

(2) DEPARTMENT-WISE DESCRIPTION

(i) DEPARTMENT OF VETERINARY ANATOMY

VETERINARY ANATOMY Credit Hours: 4+3
Dissection will be carried out on cadavers procured by way of donation of animals or animals obtained from post-mortem section and the donated animals should be either incurable or in terminal stages and prossected specimens should be used. Within one year each college must setup a body donation programme or wild body programme. Computer simulations software’s, models, mannequins, plastinated specimens, preserved body organs, models should be used for better understanding of the subject.

THEORY
UNIT: 1
Introduction to anatomy and branches of anatomy and descriptive terms used in anatomy and study of anatomical planes.


(Note: Detailed description of muscles of different regions of the body will be studied in the respective practical).

General Angiology, Neurology and Aesthesiology: Introduction to angiology. Structure of heart. General plan of systemic and pulmonary circulations, lymphatic and venous systems. Introduction to neurology and parts of central, peripheral and autonomic nervous system and sense organs. Formation of spinal nerve. Structure of meninges, brain, spinal cord. Different surface regions, joint regions, Palpable Bony areas or prominences of the body of the animal. Palpable Lymph nodes and Arteries of the body and Surface veins for Venepuncture. Sites for collection of Bone marrow and Cerebrospinal fluid.

General Splanchnology: Introduction to splanchnology, boundaries of thoracic, abdominal and pelvic cavities, topography of different organs of digestive, respiratory, urinary, endocrine, male and female reproductive systems of domestic animals and fowl. Principles and application of Radiography and Ultrasound for bones and soft tissues.
UNIT-2

UNIT-3
Head and neck: Study of cranial and facial bones, cervical vertebrae of ox and differences in horse, dog, pig and fowl. Boundaries of the oral, orbital, nasal and cranial cavities. Study of paranasal sinuses in ox, horse, dog and pig. Study of articulations and special ligaments of the head and neck. Muscles of face, mastication, eye, ear, tongue, pharynx, soft palate, hyoid and larynx. Study of teeth, hard and soft palate, tongue, pharynx, larynx, thyroid, parathyroid and salivary glands and differences in horse, dog, pig and fowl. Study of cranial nerves, blood vessels and lymph nodes of head and neck regions. Study of boundaries of jugular furrow and structures of carotid sheath along with neck muscles. Study of sense organs, trachea and oesophagus. Age determination by Dentition. Sites for Tracheotomy, Esophagotomy, Ligation of Stensons duct and Mental, Mandibular, Maxillary, Cornual, Infraorabital, Supraorbital (frontal), Orbital and Auriculopalpebral nerve blocks and surgical approach to guttural pouches in horse. Importance of Cornual nerve and superficial Temporal artery in Amputation of Horn in cattle.

UNIT-4
Thorax: Study of thoracic vertebrae, ribs and sternum of ox and differences in horse, dog, pig and fowl. Study of joints, special ligaments, blood vessels, nerves, lymph vessels and lymph nodes of thorax. Study of organs of thorax i.e. trachea, thymus, oesophagus, lungs and differences in horse, dog, pig and fowl. Study of pleura, its reflections and mediastinum. Areas of auscultation and percussion of heart and lungs and site for Paracentesis Thoracis.

UNIT-5

UNIT-6
Hind limb and pelvis: Study of bones of hind limb and pelvis of ox and differences in horse, dog, pig and fowl. Study of joints, ligaments, blood vessels, lymph nodes and nerves of hind limb, pelvis and tail region and pelvic viscera. Study of pelvic peritoneal reflections, organs of digestive, urinary, male and female reproductive systems present in pelvic cavity and differences in horse, dog, pig and fowl. Boundaries of the inguinal canal and structures of the spermatic cord, pre pubic tendon and its importance.
Study of external genital organs. Sites for Tibial, Peroneal, Plantar and Pudic nerve blocks, Patellar desmotomy, Urethrotomy, Castration, Vasectomy, cranial and caudal epidural anaesthesia.

UNIT-7
Cytology, cell junctions, study of basic tissues i.e epithelial, connective, muscular and nervous tissues, blood and bone marrow. Study of microscopic structures of digestive, circulatory, urinary, respiratory, nervous, lymphatic, endocrine, male and female genital systems and mammary glands of domestic animals. Study of microscopic structure of sense organs i.e. eye, ear and integument.

UNIT-8
Introduction to embryology, gametogenesis, fertilization, cleavage, types of eggs, morula, blastulation, gastrulation, types of implantation, twinning. Formation of foetal membranes in mammals and birds, Placenta and its classification. Different germ layers and their derivatives. Study of development of organs of digestive system including accessory structures i.e tongue, teeth, salivary glands, liver and pancreas. Study of development of organs of respiratory, urinary, circulatory, lymphatic, nervous, musculoskeletal, male and female reproductive systems. Development of endocrine glands, sense organs i.e eye and ear.

PRACTICAL
UNIT-1
Study of general terms used in anatomy, study of anatomical planes. Study of different parts of skeleton, different surface and joint regions. Study of boundaries of thoracic, abdominal and pelvic cavities. Demonstration of different types of joints, muscles tendons, ligaments, synovial bursa and synovial sheath. In situ demonstration of heart, meninges, brain and spinal cord. Boundaries of Thoracic, Abdominal and Pelvic Cavities and in situ demonstration of organs of digestive, respiratory, urinary, endocrine, male and female reproductive systems of domestic animals. Demonstration of Different surface regions, joint regions and Palpable Bony areas or prominences of the body of the animal, Common sites of fractures, Palpable Lymph nodes and Arteries of the body (ventral coccygeal artery in ox, femoral artery in dog and cat, facial artery in horse) and Surface veins for Venepuncture (cephalic vein and recurrent tarsal vein in dog and cat, jugular vein in large animals) and Sites for collection of Bone marrow and Cerebrospinal fluid. Visualization of Radiographs and ultrasound pictures of various organs and Fractures of various bones.

UNIT-2
Fore limb: Demonstration of different bones of fore limb of ox and comparison with horse, dog, pig and fowl. Dissection of the fore limb. Study of joints, ligaments, muscles, major blood vessels, lymph nodes and nerves of fore limb. Study of sites for different nerves blocks or neurectomies in fore-limb. Study of suprascapular nerve paralysis-shoulder sweeny, radial nerve paralysis-capped elbow. Structure of the equine hoof and comparison with ox. Demonstration of radiographs of normal bones of fore limb. Clinical importance of cephalic vein for intravenous injections in dog.
UNIT-3
**Head and neck:** Demonstration of cranial and facial bones, cervical vertebrae of ox and comparison with horse, dog and fowl. Dissection of muscles of face, mastication, tongue, pharynx, soft palate, hyoid, larynx, eye and ear. Dissection of superficial neck muscles. Dissection of brain and its parts. Dissection or demonstration of tunics of eye. Study of teeth, tongue, pharynx, thyroid, parathyroid and salivary glands and differences in horse, dog, pig and fowl. Study of cranial nerves, and blood vessels of head and neck regions. Study of trachea and oesophagus. Study of nerve blocks of the head i.e cornual, auriculopalpebral, Peterson’s orbital nerve block, mandibulo-alveolar and mental nerve blocks. Importance of facial artery for recording pulse in horse. Surgical importance of Stenson’s duct in domestic animals. Surgical approach to guttural pouches-Viborg’s triangle. Clinical importance of jugular vein for intravenous injections in large animals. Demonstration of radiographs of normal bones of head and neck.

UNIT-4
**Thorax:** Demonstration of thoracic vertebrae, ribs and sternum of ox and comparison with horse, dog, pig and fowl. Dissection of muscles, blood vessels, nerves and lymph nodes of thorax. Demonstration of organs of thorax i.e. trachea, oesophagus, thymus, lungs and heart and differences in horse, dog, pig and fowl. Study of pleural reflections of thoracic cavity. Demonstration of sites for auscultation and percussion. Recurrent laryngeal nerve paralysis-roaring in horses. Choke or oesophageal obstruction. Demonstration of radiographs and videos of ultrasonography of organs of thorax.

UNIT-5
**Abdomen:** Demonstration of bones forming boundaries of abdomen of ox and comparison with horse, dog, pig and fowl. Dissection of muscles, blood vessels and nerves of abdomen. Demonstration of peritoneum, omentum, mesentry and organs of digestive, urinary, male and female reproductive systems present in abdomen and differences in horse, dog, pig and fowl. Demonstration of mammary glands of cow, mare, bitch and sow. Demonstration of major veins, lymph vessels and lymph nodes of abdomen. Topographic location of abdominal viscera of ox and comparison with horse, dog, pig and fowl. Demonstration of sites for laparotomy, caesarean section, ovario-hysterectomy, catheterization of urinary bladder and sites for paravertebral and epidural anaesthesia. Demonstration of Boundaries and Clinical importance of the flank and Para Lumbar Fossa, Sites for Liver, Gall Bladder and Caecal Biopsies, Laparotomy, Rumenocentesis, Rumenotomy, abomasotomy, splenectomy Cystotomy, Caesarean Operation, catheterization of urinary bladder and enterotomy and paravertebral block. Demonstration of radiographs and videos of ultrasonography of organs of abdomen.

UNIT-6
**Hind limb and pelvis:** Demonstration of bones of hind limb of ox and comparison with horse, dog, pig and fowl. Demonstration of joints and ligaments of hind limb and pelvis. Dissection of muscles, blood vessels, lymph nodes and nerves of hind limb and pelvic cavity. Demonstration of peritoneal reflections of pelvic cavity and organs of digestive, urinary, male and female reproductive systems in pelvic cavity and differences in horse, dog, pig and fowl. Study of external genital organs. Clinical importance of femoral artery to record pulse in dog.
Clinical importance of recurrent tarsal vein for intravenous injections in dog. Demonstration of radiographs of normal bones and videos of ultrasonography of organs of pelvis. Demonstration of Sites for Tibial, Peroneal, Plantar and Pudic nerve blocks, Patellar desmotomy, Urethrotomy, Castration, Vasectomy and cranial and caudal epidural anaesthesia.

UNIT-7
Microscopy and micrometry. Comparison of light and electron microscopy. Histological techniques, processing of tissues for paraffin sectioning and haematoxylin and eosin staining. Microscopic examination of epithelium, connective tissue, muscular tissue, nervous tissue and blood. Microscopic examination of organs of digestive, circulatory, urinary, respiratory, nervous, lymphatic, endocrine, male and female genital systems and sensory organs of domestic animals.

UNIT-8
Demonstration of Placenta, umbilical cord and foetal membranes of different domestic animals. Demonstration of congenital anomalies of domestic animals as per availability. Study of slides of developing organs of different systems as per the availability. A embalmed cadaver of buffalo calf (procured through donated animals or cadavers obtained from post-mortem section) for every 24 students to be used for dissection purposes.

ANNUAL EXAMINATION

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(ii) DEPARTMENT OF VETERINARY PHYSIOLOGY AND BIOCHEMISTRY

VETERINARY PHYSIOLOGY AND BIOCHEMISTRY Credit Hours: 6+2

VETERINARY PHYSIOLOGY

VETERINARY BIOCHEMISTRY Credit Hours: 4+1

VETERINARY PHYSIOLOGY Credit Hours: 2+1

THEORY

UNIT-1 (BLOOD, CARDIOVASCULAR, NERVOUS AND MUSCULAR SYSTEMS)
Introduction to Blood; Properties of blood as a body fluid, metabolism and fate of R.B.C; Hemoglobin-chemical structure, synthesis, physiological functions, derivatives of hemoglobin; Heart- morphological characteristic, systemic excitability conduction and transmission processes.

UNIT-2 (DIGESTIVE AND RESPIRATORY SYSTEMS)

Morphological characteristic of mono gastric and poly gastric digestive system. Prehension, rumination; defecation; vomition; regulation of secretory function of saliva, stomach, intestine, pancreas; bile secretion; hunger, appetite control, developmental aspects of digestion; luminous, membranous and microbial digestion in rumen and intestine; permeability characteristics of intestine, forces governing absorption, control intestinal transport of electrolyte and water, enzymatic digestion in monogastric and fermentative digestion in rumen, modification of toxic substances in rumen. Digestion in birds.

UNIT-3 (EXCRETORY AND ENDOCRINE SYSTEMS)


UNIT-4 (REPRODUCTION, LACTATION, GROWTH AND ENVIRONMENTAL PHYSIOLOGY)

**PRACTICAL**

**UNIT-1 (BLOOD, CARDIOVASCULAR, NERVOUS AND MUSCULAR SYSTEMS)**


**UNIT-2 (DIGESTIVE AND RESPIRATORY SYSTEMS)**


**UNIT-3 (EXCRETORY AND ENDOCRINE SYSTEMS)**

Urine analysis-physiological constituents, pathological determinates, determination of Glomerular Filtration Rate. Titerable acidity, determination of inorganic phosphorus, urine ammonia nitrogen and creatinine in urine. Recording of rumenintestinal movements (Demonstration) and Bio assay for tropic hormone. Demonstration of hormone estimation.

**UNIT-4 (REPRODUCTION, LACTATION, GROWTH AND ENVIRONMENTAL PHYSIOLOGY)**


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UNIT-1 (GENERAL VETERINARY BIOCHEMISTRY)


UNIT-2 (INTERMEDIARY METABOLISM)


UNIT-3 (VETERINARY ANALYTICAL BIOCHEMISTRY)


PRACTICAL

UNIT-1 (GENERAL VETERINARY BIOCHEMISTRY)
Concentration of solutions and system International (S.I.) Units; Preparation of standardization of acids and alkalis; Preparation of Buffers; Titration curve of acid versus base; Qualitative test for carbohydrates and identification of unknown carbohydrates; Determination of acid number of an oil; Color and precipitation reactions of proteins; Estimation of amino acids (Sorensen’s Method).

UNIT-2 (INTERMEDIARY METABOLISM)
Effect of temperature and pH on enzyme activity; Estimation of blood or plasma Glucose, Protein, Inorganic phosphate, Calcium, Magnesium; Estimation of ascorbic acid by Dichlorophenolindophenol (DCPIP) method; Estimation of milk lactose by Benedicts quantitative method; Estimation of sodium and potassium by flame photometer; Paper or thin later Chromatography of amino acids; Estimation of vitamin A by colorimetry.

UNIT-3 (VETERINARY ANALYTICAL BIOCHEMISTRY)
Detection of Pathological Constituents in Urine; Assays of ALT and AST in Serum; Acute phase proteins (AorG Ratio); Estimation of total serum cholesterol, Blood Urea Nitrogen, creatinine, serum bilirubin (Direct, Indirect and Total). Principles of various diagnostic tests, normal and abnormal values in different species, differential diagnosis, correlating with diseases and rationale of arriving at the conclusion need to be rediscussed in detail during Final Professional in the course VETERINARY CLINICAL PRACTICES-II, Diagnostic Laboratory Section.

ANNUAL EXAMINATION

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UNIT-1 (GENERAL LIVESTOCK MANAGEMENT)

UNIT-2 (FODDER PRODUCTION AND CONSERVATION)
Recycling of animal washings and wastes in fodders production and use of recycle waste.

UNIT-3 (LIVESTOCK PRODUCTION MANAGEMENT-RUMINANTS)

UNIT-4 (ZOO ANIMALS PRODUCTION MANAGEMENT)
Taxonomy of important wild zoo animals. Status and conservation practices of wild life in India. Basic principles of habitat and housing of various classes of wild zoo animals. Size and space requirement (dimension) of cubicles, enclosures of important wild zoo animals. Management of livestock in fringe areas, in and surrounding the breeding areas. Feeding habits, feeds and feeding
schedules of captive animals. Restraining, capture, handling, physical examination of captive animals. Classification of zoos, management of sanctuaries, national parks etc. Acts and Rules related to captive animals. National and international organization and institutions interlinked to captive animals role and functioning.

**UNIT-5 (ANIMAL WELFARE)**


**UNIT-6 (POULTRY PRODUCTION MANAGEMENT)**


**UNIT-7 (DIVERSIFIED POULTRY PRODUCTION AND HATCHERY MANAGEMENT)**

failures–Computer applications in hatchery management.

UNIT-8 (LABORATORY OR RABBIT OR PET ANIMAL PRODUCTION MANAGEMENT)
Importance and selection of laboratory animal, care and housing standards of mice, rats, hamster and guinea pigs. General considerations on feeding and breeding of laboratory animals. Concept of production of specific pathogen free and germ free laboratory animals. Scope of rabbit farming in the country, breeds and their distributions in India. Limitation of rabbit animal production, Selection, care and management of breeding stock for commercial purpose. Identification, care and management of kindling animals. Care of new born, growing stock. Breeding and selection techniques for optimal production of rabbit. Feeds and feeding for rabbit production. Hygienic care and Housing for rabbit production. Disposal, utilization and recycling of waste etc. Preparing projects for micro (Backyard), mini and major rabbit farms. Important breeds of dogs, cats and pet birds. Feeding of dogs, cats and pet birds. Dog show: preparation for show, kennel clubs, important characteristics for judgment. Utility of dogs- guarding, defense, patrolling, riot control, scouting, espionage, mine detection, tracking, guiding, hunting, races, retrieving rescue and other uses.

UNIT-9 (SWINE OR EQUINE OR CAMEL, YAK AND MITHUN PRODUCTION MANAGEMENT)

PRACTICAL
UNIT-1 (GENERAL LIVESTOCK MANAGEMENT)
General introduction of the Institute animal farm. Identification of common tools used on animal farm. Familiarization with body points of animals. Methods of identification (marking, tattooing, branding, tagging and electronic chip under preemptive analgesia). Use of rope for knot and halter making. Dentition and ageing of animals. Preparation of animals for show and judging. Selection and culling of animals. Preparation
of project proposal

UNIT-2 (FODDER PRODUCTION AND CONSERVATION)
Visit to the fodder farm. Familiarization with the various types of fodders in the state and India. Familiarization with various fertilizers and manures. Collection, preservation and storage of feed and fodder; Damages or loss during transfer and storage; methods to prevent them. Cost of calculations of fodder production. Livestock waste utilization and recycling.

UNIT-3 (LIVESTOCK PRODUCTION MANAGEMENT-RUMINANTS)

UNIT-4 (ZOO ANIMALS PRODUCTION MANAGEMENT)
Visit to nearby wildlife sanctuary, captive animals centres to study care and management of these animals. To study housing of captive animals. To study feeds and feeding schedule of captive animals. Hygienic preparation, preservation and storage of feeds of captive animals. Familiarization about restraining, handling and physical examination of captive animals.

UNIT-5 (POULTRY PRODUCTION MANAGEMENT)

UNIT-6 (INCUBATION AND HATCHERY MANAGEMENT)
Hatchery layout and design. Project report for establishing a broiler farm. Project report for establishing a layer farm. Project report for establishing a breeder farm. Visit to commercial poultry farms or hatchery or feed mill. Visit to farms of other avian species.

UNIT-7 (LABORATORY OR RABBIT OR PET ANIMAL PRODUCTION MANAGEMENT)
Identification of body parts and handling, weighing, sexing and weaning of laboratory animals. Marking for identification of laboratory animals for purpose of their individual recording. Computation, feeding schedule of balanced diet for high breeding efficiency of laboratory animals. Maintenance of breeding records of laboratory animals. Prophylactic measures against common disease of laboratory

UNIT-8 (SWINE OR EQUINE OR CAMEL, YAK AND MITHUN PRODUCTION MANAGEMENT)

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(iv) DEPARTMENT OF VETERINARY MICROBIOLOGY

VETERINARY MICROBIOLOGY Credit Hours: 3+2

THEORY

UNIT-1 (GENERAL & SYSTEMATIC VETERINARY BACTERIOLOGY)
Introduction and history of Microbiology; Classification and nomenclature of bacteria; Microscopy and Micrometry; Bacterial stains and techniques; Structure and morphology of bacteria; Growth and nutritional requirement of aerobic and anaerobic bacteria; Normal, opportunistic and saprophytic bacterial flora: Types and sources of infection, method of transmission of infection. Pathogenicity, virulence, determinants of virulence, Epizootic and enzootic diseases, bacteremia, septicaemia and toxaemia, endotoxins, exotoxins, antitoxins, toxoids; Bacterial genetics (Mutation, Transformation, Transduction and Conjugation), plasmids and antibiotic resistance. Study of the following bacteria in relation to isolation, growth, cultural, morphological, biochemical and antigenic characteristics, epidemiology and pathogenesis, pathogenicity, diagnosis, prevention and control of bacterial diseases caused by following bacteria:

*Staphylococcus; Streptococcus; Corynebacterium, Trueperella,Rhodococcus; Listeria and Erysepelothrix; Bacillus; Mycobacterium; Clostridium, Actinomyces, Nocardia, Streptomyces and Dermatophilus; Family Enterobacteriaceae (E.coli, Klebsiella, Salmonella, Yersinia, Proteus); Pseudomonas and Burkholderia; Pasteurella, Mannheimia, Actinobacillus and Haemophilus, Brucella; Vibrio; Campylobacter; Bordetella and Moraxella; Gram negative anaerobes: Bacteriodes,
Dichlobacteria and Fusobacterium; Leptospira and other Spirochaetes; Mycoplasma, Coxiella, Neorickettsia, Ehrlichia, Anaplasma, Rickettsia; Chlamydia and Chlamydophila Emerging, re-emerging and transboundary bacterial pathogens.

UNIT-2 (VETERINARY MYCOLOGY)
Introduction, classification, general properties of fungi; Growth and Reproduction of fungi; Study of following important pathogenic fungi in relation to their isolation, growth, morphological, cultural, biochemical and antigenic characteristics, epidemiology, pathogenesis, diagnosis and control of fungal diseases caused by following genera: Candida and Cryptococcus; Aspergillus; Penicillium; Dermatophytes and Malassezia; Dimorphic fungi, Rhinosporidium and Sporotrichum; Mycetoma and Zygomycetes; Mycotic mastitis and mycotic abortion; Mycotoxicoses

UNIT-3 (MICROBIAL BIOTECHNOLOGY)
Basic concepts and scope of Recombinant DNA technology; Gene cloning, Cloning vectors and expression vectors; Transformation and transfection; Southern, Northern and Western blotting; Bioinformatics, Gene banks; Application of molecular and biotechnological techniques: Polymerase chain reaction, Nucleic acid hybridization, DNA library, DNA sequencing and DNA fingerprinting; IPR. Ethics and regulatory issues in Animal Biotechnology.

UNIT-4 (VETERINARY IMMUNOLOGY AND SEROLOGY)
History of Immunology; Lymphoid organs, tissues and Cells: Types of Immunity; Antigens, hapten, epitope, Specificity, T dependent and T independent Antigens, heterophile Antigens, cross reacting Antigens, blood group Antigens, Mitogens and factors affecting immunogenicity; Adjuvants; Antibody: Structure, physiochemical properties and functions of various classes of immunoglobulins, Theories of antibody production; Hybridoma and monoclonal antibodies, Serological reactions. Major histocompatibility complex (MHC) structure, function and gene organization; Structure of BCR and TCR; Antigen processing and presentation; Complement system: activation pathways and biological consequences; Cytokines: general properties, major types and function; Hypersensitivity: classification and mechanism of induction; Autoimmunity; Immunotolerance; Concept of Immunity to Microbes, Vaccines and other biological.

UNIT-5 (GENERAL AND SYSTEMATIC VETERINARY VIROLOGY)
History of Virology; Introduction to viruses; Structure of Viruses; Classification of Viruses; Viral Replication; Genetic and Non-genetic viral interactions; Virus-Cell Interactions; Viral Pathogenesis, Oncogenesis, latency and immunopathology. Studies on General Properties, Antigens, Cultivation, Pathogenesis, Epidemiology, Clinical Signs, Diagnosis, Prevention and Control of following Viruses and Prions Causing Diseases in Livestock and Poultry: Birnaviridae: Infectious bursal disease virus; Reoviridae: Rotaviruses, Bluetongue virus, African horse sickness virus; Paramyxoviridae: Newcastle disease virus, Canine distemper virus, PPR virus; Rhabdoviridae: Rabies virus, Ephemeral fever virus, Bornaviridae: Borna virus; Orthomyxoviridae: Swine, Equine, Avian Influenza Viruses; Coronaviridae: Infectious Bronchitis virus, Transmissible gastroenteritis virus; Arteriviridae: Equine viral arteritis virus, Picornaviridae: FMD virus, Duck viral hepatitis virus; Caliciviridae: Feline calici Virus, Togaviridae:
Equine encephalomyelitis viruses; *Flaviviridae*: Swine fever virus, BVD virus; *Retroviridae*:
Visna or maedi virus, Equine infectious anemia virus, Lymphoid leucosis virus, Bovine leukemia virus.  
*Poxviridae*: Capripoxvirus, Avipoxvirus, Cowpoxvirus; *Asfarviridae*: African Swine Fever Virus;  
*Herpesviridae*: Bovine herpes viruses, Equine Herpes viruses, Infectious laryngotracheitis virus, Marek’s disease virus, Pseudorabies virus, Malignant Catarrhal Fever virus; Duck Plague virus,  
*Adenoviridae*: Infectious Canine Hepatitis virus, Egg Drop Syndrome virus, Fowl adenovirus,  
*Papillomaviridae*: Papillomatosis, *Paroviridae*: Canine parvoviruses, Feline panleucopenia virus;  
*Circoviridae*: Chicken Anemia Virus; *Prions*: Scrapie, Bovine Spongiform Encephalopathy; Emerging, re-emerging and transboundry viruses and Viral Infections.

**PRACTICAL**

**UNIT-1 (GENERAL AND SYSTEMATIC VETERINARY BACTERIOLOGY)**
Orientation to bacteriology laboratory; Methods of sterilization and disinfection; Preparation of culture media for cultivation of aerobic and anaerobic bacteria; Methods of inoculation, Cultivation of aerobic and anaerobic bacteria; Isolation of bacteria in pure culture; Simple staining, Negative staining, Differential staining procedures of bacteria: Gram’s staining, Acid fast staining; Special staining procedures: Capsule and Spore staining; Bacterial motility; Culture sensitivity test; Outlines of collection, transportation and processing of samples for bacterial disease diagnosis. Characterization of *Staphylococcus; Streptococcus; E. coli Salmonella; Klebsiella and Proteus; Pseudomonas; Pasteurella; Clostridium;* Isolation and identification of bacteria from clinical cases of Mastitis, Abortions, Enteric, Respiratory and Pyogenic infections.

**UNIT-2 (VETERINARY MYCOLOGY)**
Outline of collection, transportation and processing of samples for fungal disease diagnosis, Preparation of culture media, Cultivation and slide culture technique of fungi; Cultural characteristics of fungi; Lactophenol cotton blue staining to study morphology of fungi; Culture sensitivity test of fungi; Diagnosis of Aspergillosis and Candidiasis; Demonstration of other important yeast, moulds and Dermatophytes

**UNIT-3 (MICROBIAL BIOTECHNOLOGY)**
Extraction and quantitation of nucleic acid; Plasmid isolation and plasmid profiling; Agarose gel electrophoresis for studying or diagnosis of nucleic acid of microbes; SDS PAGE electrophoresis for studying or diagnosis of proteins of microbes; Use of Multimedia and audio-visual aids for molecular biology aspects.

**UNIT-4 (VETERINARY IMMUNOLOGY AND SEROLOGY)**
Inoculations of lab animals, preparation of antigen, Raising of antisera, separation and preservation of serum, Concentration of Immunoglobulins, Agglutination tests: Plate, Tube, Haemagglutination, Precipitation test: Agar gel precipitation Test, Single radial immunodiffusion test, Immunoelectrophoresis, Cell mediated immune response (DTH), Enzyme linked immunosorbent assay (ELISA), Visit and appraisal of Veterinary biological institute.
UNIT-5 (GENERAL AND SYSTEMATIC VETERINARY Virology)
Orientation to a virology laboratory; Collection, preservation, transport of samples and their processing in virology laboratory; Isolation of viruses in laboratory animals or poultry or embryonated chicken eggs; Preparation of media and reagents for cell culture; Subculture and maintenance of continuous cell lines; Quantitation of cells by viable cell counts in a haemocytometer; Cryopreservation and recovery of cell cultures; Preparation of Primary cell culture (chicken embryo fibroblast or Lamb kidney); Demonstration of cytopathic effect by viruses in cell culture (Important virus isolates available in the department); Demonstration of Titration of virus by TCID$_{50}$ and plaque assay in cell cultures*; Demonstration of neutralizing antibodies by serum neutralization test in cell cultures*; Agar gel precipitation test for detection of virus infection*; Titration of Newcastle disease virus by haemagglutination test; Haemagglutination inhibition test for detection of antibodies to Newcastle disease virus; ELISA for detection of viral antigen and antibodies; Molecular techniques for viral disease diagnosis *Important virus isolates available in the department.

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(v) DEPARTMENT OF VETERINARY PATHOLOGY

VETERINARY PATHOLOGY Credit Hours: 4+2=6

THEORY

UNIT-1 (GENERAL VETERINARY PATHOLOGY)
UNIT-2 (SYSTEMIC VETERINARY PATHOLOGY)
Pathological changes affecting Digestive, Respiratory, Musculoskeletal, Cardiovascular, Haematopoietic, Lymphoid, Urinary, Reproductive, Nervous, Endocrine systems, Skin and Appendages, Ear and Eye.

UNIT-3 (ANIMAL ONCOLOGY, VETERINARY CLINICAL PATHOLOGY AND NECROPSY)
Animal Oncology: Definitions, general characteristics and classification of neoplasms. Differences between benign and malignant tumours, aetiology, carcinogenesis and spread of neoplasms, tumour immunity, effects and diagnosis of tumours, staging and grading of neoplasms. Pathology of various types of tumours in domestic animals (epithelial, connective tissue, hematopoietic tissue etc.) Veterinary Clinical Pathology: Introduction, Haematology – Different anticoagulant used in haematology, interpretation of blood tests (haemoglobin, packed cell volume, total erythrocyte count, erythrocytic indices, erythrocytic sedimentation rate, total leukocyte count, absolute count of different leucocytes), blood smear examination and its interpretation. Urinalysis- Interpretation of physical, chemical and microscopic examination of urine. Study of biopsy and cytology including exfoliative cytology as rapid diagnostic techniques. Necropsy: Introduction, objectives, pre-necropsy guidelines, procedure for post mortem examination of various species of animals including wild animals, post mortem changes, collection, preservation and dispatch of specimens (morbid materials) for laboratory examination, writing of post mortem report, veterolegal necropsy, veterolegal wounds.

UNIT-4 (PATHOLOGY OF INFECTIOUS AND NON-INFECTIOUS DISEASES OF DOMESTIC ANIMALS)
Pathology of viral infections: Pathogenesis, gross and microscopic pathology of foot and mouth disease, Rinderpest, malignant catarrhal fever, blue tongue, infectious bovine rhinotracheitis, bovine viral diarrhoea, Peste des Petitis (PPR), equine infectious anaemia, equine influenza, equine viral arteritis, equine rhinopneumonitis, classical swine fever, swine influenza, rabies, canine distemper, infectious canine hepatitis, canine parvovirus infection, feline panleukopenia, maedi, jaagziekte, pox virus diseases in different animals. Vesicular stomatitis, vesicular exanthema, equine encephalomyelitis, diseases caused by rota and corona viruses. Pathology of prion diseases (scrapie, bovine and feline spongiform encephalopathies). Pathology of bacterial infections: Pathogenesis, gross and microscopic pathology of tuberculosis, Johne's disease, actinomycosis, actinobacillosis, anthrax, clostridial group of diseases (black quarter, black disease, enterotoxaemia, braxy, botulism tetanus), streptococcosis including strangles in horses, staphylococcosis, glanders, pasteurellosis, leptospirosis, listeriosis, swine erysipelas, brucellosis, corynebacterium infections (caseous lymphadenitis, pseudotuberculosis), campylobacteriosis, salmonellosis, and colibacillosis including oedema disease in pigs, and necrobacillosis). Pathogenesis, gross and microscopic pathology of mycoplasma infection (contagious bovine pleuropneumonia, contagious caprine pleuropneumonia, porcine enzootic pneumonia), diseases of chlamydial group, Q-fever, anaplasmosis and ehrlichiosis.

Pathogenesis, gross and microscopic pathology of superficial and deep mycoses - ringworm (dermatophytosis), aspergillosis, zygomycosis, histoplasmosis, cryptococosis, rhinosporidiosis and candidiasis.
Pathogenesis, gross and microscopic pathology of aflatoxicosis, ochratoxicosis, trichothecosis, Degnala disease and ergotoxicosis Pathogenesis, gross and microscopic pathology of fasciolosis, babesiosis, theileriosis and trypanosomosis. Pathological changes (in brief) of amphistomiasis, ascariasis, strongylosis, haemonchosis, spirocercosis, filariosis, hookworm, tapeworm infections, coccidiosis, toxoplasmosis, cryptosporidiosis. Pathological changes of nutritional imbalances (in brief) due to carbohydrates, proteins, fats, minerals and vitamins and metabolic diseases (pregnancy toxaemia, post-parturient haemoglobinuria, hypomagnesemic tetany, azoturia, and sway back or enzootic ataxia, pica and Rheumatism like syndrome). Gross and microscopic pathology in (brief) of toxicities like arsenic, copper, lead, mercury, cadmium, strychnine, nitrate or nitrite, hydrocyanic acid, fluoride, selenium and oxalates; insecticide or pesticide poisoning, plant poisoning (braken fern, gossypol, ratti and lantana)

UNIT-5 (AVIAN PATHOLOGY)
Avian Inflammation, Viral Diseases: Pathogenesis, gross and microscopic pathology of Ranikhet disease, infectious bursal disease, infectious bronchitis, infectious laryngotracheitis, fowl pox, avian influenza, Marek's disease, leukosis or sarcoma group of diseases, reticuloendotheliosis, avian encephalomyelitis, inclusion body hepatitis, hydro-pericardium syndrome, chicken infectious anaemia, avian nephritis, egg drop syndrome, reovirus infections. Bacterial Diseases: Pathogenesis, gross and microscopic pathology of colibacillosis, infectious coryza, clostridial diseases, salmonella infections, fowl cholera, tuberculosis and spirochaetosis. Pathogenesis, gross and microscopic pathology of Mycoplasma infections, chlamydiosis. Pathogenesis, gross and microscopic pathology of aspergillosis, thrush, favus, aflatoxicosis, ochratoxicosis and trichotheosis. Gross and microscopic pathology (in brief) of helminthic diseases (flukes, cestodes, nematodes), protozoal diseases (coccidiosis, histomoniasis), ectoparasites. Gross and microscopic pathology of nutritional imbalances due to carbohydrates, proteins, minerals and vitamins. Miscellaneous diseases (Heat stroke, vent gleet, internal layer, false layer, pendulous crop, breast blister, ascites syndrome, fatty liver and kidney syndrome, fatty liver syndrome, cage layer fatique, gout, hemorrhagic syndrome, round heart disease, impaction of oviduct, egg bound condition, bumble foot) and common vices.

UNIT-6 (PATHOLOGY OF DISEASES OF LABORATORY AND WILD ANIMALS)
Pathology of important diseases of rats, mice, and guinea pigs (Tyzzer's disease, Pseudotuberculosis, Salmonellosis, Infectious ectromelia, Infantile diarrhea, Murine hepatitis virus, Lymphocytic choriomeningitis); Pathology of important diseases of rabbits (Pasteurellosis, Blue breasts, Treponematosis, Enterotoxaemia, Rabbit pox, Infectious myxomatosis, Papillomatosis, Coccidiosis, Mite infestation). Gross and microscopic pathology of important diseases of wild animals (West Nile Fever, Rabies, FMD, Pox, Kyasanur forest disease, Infectious hepatitis virus, Anthrax, Tuberculosis, Colibacillosis, Clostridial infections Trypanosomosis, Babesiosis, Theileriosis, Nutritional deficiency diseases)
PRACTICAL

UNIT-1 (GENERAL VETERINARY PATHOLOGY)
Study of gross pathological specimens and recognition of pathological lesions. Histopathological techniques—Processing of tissue for paraffin embedding technique, section cutting, staining and identification of microscopic lesions. Examination of histopathological slides showing general pathological alterations.

UNIT-2 (SYSTEMIC VETERINARY PATHOLOGY)
Study of gross specimens and histopathological slides pertaining to systemic pathology.

UNIT-3 (ANIMAL ONCOLOGY, VETERINARY CLINICAL PATHOLOGY AND NECROPSY)
Macroscopic and microscopic examinations of various types of benign and malignant tumours. Examination of blood for routine haematological tests in domestic animals and poultry. Physical, chemical and microscopic examination of urine. Post mortem examination of different species of animals including wild and laboratory animals.

UNIT-4 (PATHOLOGY OF INFECTIOUS AND NON-INFECTIOUS DISEASES OF DOMESTIC ANIMALS)
Post mortem examination and its interpretations, Study of gross specimens and histopathological slides of various organs pertaining to infectious and non-infectious diseases of domestic animals. Demonstration of causative agents in tissue section by special staining methods and use of rapid diagnostic tests.

UNIT-5 (AVIAN PATHOLOGY)
Post mortem examination of poultry and writing of post mortem report. Collection, preservation and dispatch of morbid materials in poultry diseases. Study of gross specimens and histopathological slides of different diseases of poultry.

UNIT-6 (PATHOLOGY OF DISEASES OF LABORATORY AND WILD ANIMALS)
Post mortem examination of laboratory and wild animals. Study of gross specimen and histopathological slides of diseases affecting laboratory and wild animals.

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UNIT-1 (BIOSTATISTICS AND COMPUTER APPLICATION)

UNIT-2 (PRINCIPLES OF ANIMAL AND POPULATION GENETICS)

UNIT-3 (PRINCIPLES OF ANIMAL BREEDING)

PRACTICAL

UNIT-1 (BIOSTATISTICS AND COMPUTER APPLICATION)

UNIT-2 (PRINCIPLES OF ANIMAL AND POPULATION GENETICS)

UNIT-3: (PRINCIPLES OF ANIMAL BREEDING)
(vii) **DEPARTMENT OF ANIMAL NUTRITION**

**ANIMAL NUTRITION**  

**Credit Hours: 3+1**

**THEORY**

**UNIT-1 (PRINCIPLES OF ANIMAL NUTRITION AND FEED TECHNOLOGY)**


**UNIT-2 (APPLIED RUMINANT NUTRITION-I)**


**UNIT-3 (APPLIED RUMINANT NUTRITION-II)**

Nutrient requirements and methods for assessing the energy and protein requirements for maintenance and production in terms of growth, reproduction, milk, meat, wool and draft purpose. General principles of computation of rations.
Formulation of rations and feeding of dairy cattle and buffaloes during different phases of growth and production (neonate, young, adult, pregnant, lactating and dry animals; breeding bull) and working animals. Formulation of ration and feeding of sheep and goat during different phases of growth and production (milk, meat and wool). Feeding of high yielding animals and role of bypass nutrients. Metabolic disorders and nutritional interventions. Use of NPN compound for ruminants.

UNIT-4 (APPLIED NON-RUMINANT NUTRITION)
Nutrient requirements in poultry, swine and equine - Energy and protein requirement for maintenance and production. Methods adopted for arriving at energy and protein requirements for maintenance and production in terms of growth, reproduction and production (egg, meat and work). Feeding standards for non-ruminants and poultry. Formulation of rations as per Bureau of Indian Standards and Indian Council of Agricultural Research specifications. Feeding of swine (Piglets, Growers, Lactating and pregnant sows, Breeding boar, Fattening animals), equine (foal, yearling, broodmare, stallion and race horses) and poultry (Starter, Growers, Broilers, Layers) with conventional and unconventional feed ingredients. Feeding of ducks, quails, turkeys and laboratory animals. Nutrient requirements of mice, rat, rabbit and guinea pig. Diet formulation, preparation and feeding of rabbits and laboratory animals. Nutrient requirement and feeding of different categories of dogs and cats; peculiarities of feeding cats. Feeding of wild animals and birds in captivity. Metabolic disorders and nutritional intervention.

PRACTICAL

UNIT-1 (PRINCIPLES OF ANIMAL NUTRITION AND FEED TECHNOLOGY)

UNIT-2 (APPLIED RUMINANT NUTRITION-I)
Calculation of nutritive value of different feed stuffs in terms of digestible crude protein (DCP), total digestible nutrient (TDN), Nutritive ratio (NR) and balance of nutrients.

UNIT-3 (APPLIED RUMINANT NUTRITION-II)
Calculation of requirements of nutrients in terms of DCP, TDN and metabolisable energy (ME) for maintenance, growth, and other types of production like meat, milk, wool, reproduction and draft purpose. Formulation of rations for different categories of livestock under different conditions. Formulation of rations for feeding of livestock during scarcity periods. Visit to Animal Farm and Feed Mill.

UNIT-4 (APPLIED NON-RUMINANT NUTRITION)
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(viii) DEPARTMENT OF VETERINARY PHARMACOLOGY AND TOXICOLOGY

VETERINARY PHARMACOLOGY

Credit Hours: 4+1

THEORY

UNIT-1 (GENERAL PHARMACOLOGY)


UNIT-2 (DRUGS ACTING ON AUTONOMIC NERVOUS SYSTEM)


UNIT-3 (DRUGS ACTING ON CENTRAL NERVOUS SYSTEM)

Classification of drugs acting on CNS. History, mechanism and stages of general anaesthesia. Inhalant, intravenous and dissociative anaesthetics. Hypnotics and sedatives; psychotropic drugs, anticonvulsants, opioid analgesics, non-steroidal anti-inflammatory drugs, analeptics and other CNS stimulants. Drugs acting on somatic nervous system: Local anaesthetics, muscle relaxants. Euthanizing agents.

UNIT-4 (DRUGS ACTING ON DIFFERENT BODY SYSTEMS)

Drugs acting on digestive system: Stomachics, antacids and antiulcers, prokinetics, carminatives, antizymotics, emetics, antiemetics, purgatives, anti diarrhoeals, choleric and cholagogues. Rumen pharmacology. Drugs acting on cardiovascular system: Cardiotonics and cardiac stimulants, antiarrhythmic drugs, vasodilators and antihypertensive agents, haematopoietic drugs, coagulants and anticoagulants. Drugs acting on respiratory system: Expectorants and antitussives, respiratory stimulants, bronchodilators and mucolytics. Drugs acting on urogenital system: Diuretics, drugs...

UNIT-5 (VETERINARY CHEMOTHERAPY)

UNIT-6 (VETERINARY TOXICOLOGY)

PRACTICAL
UNIT-1 (GENERAL PHARMACOLOGY)

UNIT-2 (ANS PHARMACOLOGY)
Demonstration of the action of autonomic agonists and antagonists on intact or isolated preparations of the laboratory animals. Simulated animal experiments should be preferred over use of live animals. The lab for simulated experiments should be established within a span of one year.

UNIT-3 (CNS PHARMACOLOGY)
Handling of lab animals. Regulatory guidelines for use of lab animals. Demonstration of the effect of CNS active drugs and local anaesthetics in laboratory animals. The lab for simulated experiments should be established within a span of one year.

UNIT-4 (VETERINARY CHEMOTHERAPY)
Demonstration of various chemotherapeutic agents and their dosage forms. Demonstration of antibiotic sensitivity test and its interpretation.

UNIT-5 (VETERINARY TOXICOLOGY)
Collection, preservation and dispatch of material for toxicological analysis. General principles for toxicological analysis. Detection of heavy metals or non-metals or plant poisons. Demonstration of agrochemical toxicity and its antidotal therapy via simulation methods. Demonstration of toxic weeds and plants of local area. Methods of calculation of median lethal dose (LD₅₀) or maximum tolerated dose (MTD).

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DEPARTMENT OF VETERINARY PUBLIC HEALTH AND EPIDEMIOLOGY
VETERINARY PUBLIC HEALTH AND EPIDEMIOLOGY Credit Hours: 3+1=4

THEORY

UNIT-1 (VETERINARY PUBLIC HEALTH AND FOOD SAFETY)

UNIT-2 (VETERINARY EPIDEMIOLOGY)

UNIT-3 (ZOONOTIC DISEASES)
Definition, history and socio-economic impact of zoonotic diseases. Classification of zoonoses and approaches to their management. Multisectoral approach for zoonoses prevention and control. Emerging, re-emerging and occupational zoonoses. Role of domestic, wild, pet and laboratory animals and birds in transmission of zoonoses. Zoonotic pathogens as agents of bioterrorism.
Epidemiology, clinical manifestations and management of the following zoonoses: Rabies, Japanese encephalitis, influenza, Kyasanur forest disease, Crimean Congo haemorrhagic fever, Nipah encephalitis, Ebola virus infection, anthrax, brucellosis, tuberculosis, leptospirosis, listeriosis, plague, glanders, Q fever, rickettsiosis, chlamydioidosis, taeniasis, cysticercosis, hydatidosis, larva migrans, iphyllobothriasis, trichinellosis, toxoplasmosis, fasciolosis, paragonimiasis, sarcocystosis, cryptosporidiosis, amoebiasis, giardiasis, leishmaniasis, superficial and systemic mycosis and prion diseases. Foodborne bacterial zoonoses: salmonellosis, *E. coli* infection, staphylococcal gastroenteritis, clostridial food poisoning, campylobacteriosis etc.

UNIT-4 (ENVIRONMENTAL HYGIENE)


PRACTICAL

UNIT-1 (VETERINARY PUBLIC HEALTH AND FOOD SAFETY)

microbiological and analytical techniques. Demonstration of speciation of meat.

UNIT-2 (VETERINARY EPIDEMIOLOGY)

UNIT-3 (ZOONOTIC DISEASES)
Detection, isolation and identification of important pathogens of zoonotic importance from animal, human and environmental sources including foods of animal origin. Detection of zoonotic diseases by serological, molecular and hypersensitivity tests. Study of probable association of human disease conditions with animal diseases present in an area. Study of rural environment and health status of rural community.

UNIT-4 (ENVIRONMENTAL HYGIENE)
Sampling methods for testing quality of air, water, soil and other environmental sources. Physical, chemical and microbiological examination of water. Estimation of residual chlorine and chlorine demand. Isolation & identification of pathogens from air, water and other environmental sources. Disinfection of animal houses. Determination of efficacy of disinfectants – Phenol coefficient, MIC and MBC. Demonstration or visit to water purification system. Demonstration of various ventilation systems in animal houses and specialized laboratories. Demonstration of toxic residues in water and other environmental sources. Visit to local polluted site and documentation of local environmental problems – like dumping grounds, local slum areas, crowded localities etc.

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DEPARTMENT OF VETERINARY PARASITOLOGY

VETERINARY PARASITOLOGY

THEORY

UNIT-1 (GENERAL VETERINARY PARASITOLOGY)


UNIT-2 (TREMATODES AND CESTODES OF VETERINARY IMPORTANCE)

Trematodes: Introduction, general account and classification, general life cycle of trematodes with morphological features of their developmental stages. Important morphological features, life cycles, modes of transmission, pathogenesis, epidemiology, diagnosis and general control measures (including chemo- and immuno-prophylaxis) of the following trematode parasites: Liver flukes (Fasciola, Dicrocoelium and Opisthorchis), intestinal flukes (Fasciolopsis). Blood flukes causing nasal schistosomosis (Schistosoma nasalis), visceral schistosomosis (S. spindale, S. indicum, S. incognitum) and cercarial dermatitis. Paramphistomes (Paramphistomum, Cotylophoron, Calicophoron, Gigantocotyle, Gastrothylax, Fischoederius, Carmyerius, Gastrodiscus, Gastrodiscoides and Pseudodiscus). Paragonimus, Prosthogonimus and Echinostomes. Cestodes: Introduction, general account and classification, general life cycle of cestodes with morphological features of their developmental stages (Metacestodes). Important morphological features, life cycles, modes of transmission, pathogenesis, epidemiology, diagnosis and management of the following cestode parasites: Equine tape worms (Anoplocephala, Paranoplocephala) and ruminant tape worms (Moniezia, Avitellina, Stilesia, Thysaniezia). Dog tape worms (Dipylidium, Taenia, Echinococcus). Poultry tape worms (Davainea, Cotugnia, Raillietina, Amoebotaenia, Choanotaenia and Hymenolepis. Broad fish tapeworm (Diphyllobothrium) and Spirometra.

UNIT-3 (NEMATODES OF VETERINARY IMPORTANCE)

Nematodes: Introduction, general account and classification, general life cycle of nematodes with morphological features of their developmental stages. Important morphological features, life cycles, modes of transmission, pathogenesis, epidemiology, diagnosis and management of the following nematode parasites: Ascaris, Parascaris, Toxocara, Toxascaris, Ascaridia, Heterakis and Oxyuris.
Strongyloides, Strongylus, Chabertia, Syngamus and Oesophagostomum.

Kidney worms (Stephanurus and Dioctophyma), hook worms (Ancylostoma and Bunostomum).


Study of anthelmintic resistance and its types.

UNIT-4 (ARTHROPODS OF VETERINARY IMPORTANCE)


UNIT-5 (PROTOZOA OF VETERINARY IMPORTANCE)

Introduction, general account and classification, general life cycle of protozoa with morphological features of their developmental stages. Differentiation from bacteria and rickettsia. Important morphological features, life cycles, modes of transmission, pathogenesis, epidemiology, diagnosis and general control measures (including chemo- and immuno-prophylaxis) of the following protozoan parasites of veterinary and zoonotic importance: Leishmania (Visceral and cutaneous leishmanosis), Trypanosoma (T. evansi, T. theileri, T. equiperdum). Trichomonas (Bovine and avian trichomonosis). Histomonas (Black head in turkeys). Entamoeba, Giardia and Balantidium spp, Coccidia and coccidiosis of poultry and domestic animals. Cyst forming coccidia (Toxoplasma, Sarcocystis and Neospora caninum) and Cryptosporidium. Malarial parasites of animals and poultry (Plasmodium, Haemoproteus and Leucocytozoon). Piroplasms (Babesia, Theileria) and Hepatozoon. Anaplasma and Ehrlichia Resistance to antiprotzoals.

PRACTICAL

UNIT-1 (GENERAL VETERINARY PARASITOLOGY)

Demonstration of the types of final and intermediate hosts. Demonstration of different organsortissues of the hosts affected with endo-and ectoparasites. Visit to Post Mortem Hall to acquaint with

UNIT-2 (TREMATODES AND CESTODES OF VETERINARY IMPORTANCE)

UNIT-3 (NEMATODES OF VETERINARY IMPORTANCE)
Study of morphological characters of adults and developmental stages of the following nematodes: *Ascaris, Parascaris, Toxocara, Toxascaris, Ascaridia, Heterakis, Oxyuris, Strongyloides, Strongylus, Chabertia, Syngamus and Oesophagostomum, Stephanurus, Dioctophyma, Ancylostoma, Bunostomum, Ostertagia, Trichostrongylus, Cooperia, Nematodirus, Haemonchus and Mecistocirrus, Habronema, Draschia, Thelazia, Spirocerca, Gongylonema, Physaloptera, Gnathostoma, Dicrofilaria, Parafilaria, Onchocerca, Setaria, Stephanofilaria, Dictyocaulus, Muellerius, Protostrongylus, Metastrongylus, Dracunculus, Trichinella, Trichuris, Capillaria and Macracanthorhynchus*. Demonstration of gross and microscopic lesions of parasites.

UNIT-4 (ARTHROPODS OF VETERINARY IMPORTANCE)

UNIT-5 (PROTOZOA OF VETERINARY IMPORTANCE)
Study of morphological characters of different stages of following protozoan parasites: *Leishmania, Trypanosoma, Trichomonas, Histomonas, Entamoeba, Balantidium, Giardia, Eimeria, Isospora,*
Sarcocystis, Toxoplasma and Cryptosporidium.


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(xi) DEPARTMENT OF LIVESTOCK PRODUCTS TECHNOLOGY

LIVESTOCK PRODUCTS TECHNOLOGY Credit Hours: 2+1=3

THEORY

UNIT-1 (MILK AND MILK PRODUCTS TECHNOLOGY)


UNIT-2 (WOOL SCIENCE)

Introduction to wool, fur, pelt and specialty fibers with respect to processing industry. Glossary of terms of wool processing. Basic structure and development of wool follicle. Post shearing operations of wool, classification and grading of wool, physical and chemical properties of wool. Impurity of wool, factors influencing the quality of wool. Brief outline of processing of wool.

UNIT-3 (ABATTOIR PRACTICES AND ANIMAL BYPRODUCTS TECHNOLOGY)

Layout and management of rural, urban and modern abattoirs. HACCP concepts in abattoir management. FSSA standards on organization and layout of abattoirs. Animal welfare and pre-slaughter
care, handling and transport of meat animals including poultry.


**UNIT-4 (MEAT SCIENCE)**

Prospect of meat industry in India. Structure and composition of muscle (including poultry muscle).


**PRACTICAL**

**UNIT-1 (MILK AND MILK PRODUCTS TECHNOLOGY)**

Sampling of milk. Estimation of fat, solid not fat (SNF) and total solids. Platform tests. Cream separation.

Detection of adulteration of milk. Determination of efficiency of pasteurization. Preparation of milk products like ghee, paneer or channa, khoa, ice-cream or kulfi, milk beverages. Visit to modern milk processing and milk products manufacturing plants.

**UNIT-2 (WOOL SCIENCE)**

Wool sampling techniques. Tests for identification of wool; determination of fleece density, fiber diameter, staple length, crimp and medulation percentage. Scouring or clean fleece yield.

**UNIT-3 (ABATTOIR PRACTICES AND ANIMAL BYPRODUCTS TECHNOLOGY)**

Methods of ritual and humane slaughter, flaying and dressing of food animals including poultry.

Carcass evaluation. Determination of meat yield, dressing percentage, meat bone ratio and cut up parts. Preparation of different abattoir byproducts. Visit to slaughterhouses or meat plants.

**UNIT-4 (MEAT SCIENCE)**

Packaging of meat, poultry and shell eggs and their products. Estimation of deteriorative changes in meat and meat products. Preparation of comminuted and non comminuted meat and poultry products.

Evaluation of external and internal egg quality and preservation technique of eggs.
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DEPARTMENT OF VETERINARY AND ANIMAL HUSBANDRY EXTENSION EDUCATION

THEORY

UNIT-1 (LIVESTOCK BASED LIVELIHOODS AND THEIR EVOLUTION)

UNIT-2 (EXTENSION EDUCATION AND DEVELOPMENT)

UNIT-3 (RURAL SOCIOLOGY IN VETERINARY EXTENSION)
Concept of sociology and rural sociology in animal husbandry extension. Culture: definition, elements, change, impact on production systems. Basic sociological concepts - society, community and association. Rural society: characteristics and differences among society, community and culture. Characteristics and differences among tribal, rural and urban communities. Social control: concept and means of social control (techniques, folkways, taboos, mores and laws). Social stratification: definition, forms and characteristics (caste system and class system). Social institutions in rural society: Social, economic, political, religious and educational (definition, composition and function). Social change: concept, importance and factors. Social groups: different groups, classification of social groups and their characteristics. Leadership: definition, functions of leader, types of rural leaders, Key communicators and their role in the animal husbandry extension.
UNIT-4 (TRANSFER OF TECHNOLOGY FOR LIVESTOCK DEVELOPMENT)

UNIT-5 (COMMUNICATION AND EXTENSION TEACHING METHODS)
Communication and its functions. Basic concepts: communication fidelity, communication gap, time lag in communication, empathy, homophily and heterophily, propaganda, publicity, persuasion and development communication. Types of communication: Intrapersonal, interpersonal, verbal, non-verbal, vertical, horizontal, organizational communication etc. Elements of communication: Communicator, message, channel, treatment of message, audience, and audience response (feedback). Barriers of communication. Individual contact methods: Farm and home visit, farmer’s call, personal letter, adaptive or minikit trial, farm clinic etc. Group contact methods: Result demonstration, method demonstration, group meeting, training, field day or farmers’ day, study tour etc. Mass contact methods: Farm publications (leaflet, folder, pamphlet, booklet, bulletin, farm magazine, newsletter etc.), mass meeting, campaign, exhibition, newspaper, radio, television, mobile short message service. Selection and use of extension teaching methods.

UNIT-6 (LIVESTOCK ECONOMICS AND MARKETING)
Introduction to Economics and Livestock Economics: definition and scope (production, consumption, exchange and distribution). Basic concepts- wants, goods, wealth, utility, price, value, assets, capital, money, income etc. Important features of land, labour, capital and organization. Theories of demand, supply and cost. Theories of production (law of diminishing return, increasing return, constant return and return to scale). Concept of market: market, market structure and classification of markets. Market price and normal price, price determination under perfect competition in short and long run. Marketing functions: meaning and their classification (packaging, transportation, grading, standardization, storage and warehousing, processing and value addition, buying and selling, market information, financing, risk bearing, minimization of risks (speculation and hedging). Marketing agencies, institutions and channels
for livestock and livestock products.

Government interventions and role in marketing of livestock and livestock products. External trade in livestock products, recent policies on trade and international trade agreements and their implications in livestock sector.

UNIT 7 (LIVESTOCK ENTREPRENEURSHIP)

Definition of entrepreneur, entrepreneurship, enterprise and manager. Difference between entrepreneur and entrepreneurship, entrepreneur and enterprise, entrepreneur and manager. Theories of entrepreneurship: Sociological theory, economic theory, cultural theory, psychological theory. Types, characteristics and functions of an entrepreneur. Forms of entrepreneurship: (Sole proprietorship, partnership, corporation, cooperative, joint stock company, Private and Public Limited Company). Introduction to financial management: concept, function, analysis of financial statement, sources of capital (banks, venture capitals, etc.). Project appraisal - Introduction, importance, techno-economic feasibility, criteria of project evaluation (discounted and non-discounted), capital budgeting, etc. Business plan for enterprise. Institutions promoting entrepreneurship in India. Entrepreneurship development programmes. Accounting: objectives, common terms. Personnel management - identification of work, job analysis, division of labour etc. Resource management - organization aspect of livestock farms, resources and procurement of inputs and financial resources, break-even - analysis etc.

UNIT 8 (INFORMATION AND COMMUNICATION TECHNOLOGY)

Strengths and limitations of ICTs application in livestock sector and farmers capacity building. Information kiosk, E-learning, CAD, virtual class room, virtual reality, multi-media etc. Cyber extension - problems and prospects in livestock extension. Computer networking: (LAN, MAN, WAN, Internet, tele-conferencing, tele-text, radio-text, video-text, interactive cable distribution system, satellite communication, internet, www, etc.).

UNIT 9 (CONTEMPORARY ISSUES IN LIVESTOCK ENTERPRISES)

Gender and animal husbandry - definition, difference between gender and sex, role of women in animal husbandry, gender sensitization, importance of gender sensitization in animal husbandry, need for gender analysis, gender budgeting and mainstreaming. Salient features of recent livestock census, livestock insurance scheme, national livestock mission. Sustainability - concept of sustainability of livestock production system (social, environmental and economic challenges faced). Introduction to environmental consequences of livestock rearing. Animal welfare: Introduction to animal welfare, ethics and rights. Importance of animal welfare in the contemporary society. Expectations from veterinary professionals.

PRACTICAL

UNIT 1 Tools of data collection: Preparation of instrument for conducting social survey; Visit to nearby village: Conducting social survey for assessment of farming system and constraints; Data analysis and reporting; Organizing demonstration for farmers; identification of key communicators by Socio-metric method; Familiarization with audio-visual aids; Principle and use of projectors; Preparation of Radio Script Preparation of Television script; Preparation and use of poster; Preparation and use of chart; Preparation and use of flash cards; Preparation and use of farm publications for extension work;
Planning and organizing an awareness campaign (Health and Production);
Planning and organization of animal health camps; Exercise on rapid rural appraisal (RRA); Exercise on participatory rural appraisal (PRA) technique; Planning and organization of group discussion.

UNIT-2 Rules of debit and credit in livestock business transactions. Journal Entry and Ledger Posting.

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(xiii) VETERINARY CLINICAL COMPLEX (VCC)

VETERINARY CLINICAL PRACTICES-I (Third year) Credit Hours: 0+1
Orientation and understanding the working of Veterinary Clinics including hospital set up, administration and work force management. Doctor client interaction, Orientation to local language or dialector local terminology of the diseases. Registration, filling up registration cards, history taking, handling and restraining of animals. Preliminary clinical examination such as recording of temperature, respiration, pulse, motility of digestive system etc. Familiarization and practice of first aid procedures. Practice of collection, labeling, packaging and storage of laboratory samples. Preparation and sterilization of surgical packs, instruments, drapes and operation theaters. Familiarisation with antiseptic dressing techniques and bandaging.

VETERINARY CLINICAL PRACTICES-II (Fourth year) Credit Hours: 0+6
The students shall be Imparted the trainings on rotation basis in the following sections of Veterinary Clinical Complex (VCC):

Ambulatory Section:
Each Veterinary college should adopt five villages where in the health, production and treatment part should be taken care of in a holistic manner. Handling, examination, diagnosis and treatment of sick animals
in the field conditions under the supervision of faculty.
Ambulatory Clinics shall be operated by small groups of students and faculty of clinical departments through an equipped ambulatory mobile unit.

**Diagnostic Laboratory Section:**
Veterinary Clinical Diagnostic Laboratory will be an important component of Teaching Veterinary Clinical Complex that will impart training to students for laboratory evaluation and interpretation of clinical samples leading to definitive diagnosis of diseases. This activity will improve competence of students in examining clinical samples (biochemical, toxicological, pathological, parasitological and bacteriological) at the clinical complex, analyzing and correlating with clinical findings and interpreting the results. Collection labeling, transportation, and preservation of body fluid samples, writing results and report. Interpretation of data in relation to specific diseases. Clinical significance and interpretation of serum glucose, lipids, proteins, blood urea nitrogen, creatinine, uric acid, ketone bodies, bilirubin and electrolytes from samples. Clinical significance and interpretation of examination of urine samples. Clinical evaluation of blood (Haemoglobin, packed cell volume, total erythrocytic count, erythrocytic sedimentation rate, total leukocytic count and differential leukocytic count) from clinical samples. Evaluation of acid-base balance and interpretation. Biochemical aspects of digestive disorders, endocrine functions. Liver, kidney and pancreatic function tests. Role of enzymes for detection of tissue or organ affection. Preparation of microscopic slides from tissue collected for diagnosis and its histopathological interpretation. Examination of biopsy and morbid material for laboratory diagnosis. Laboratory evaluation and diagnosis of samples for parasitic diseases (routine faecal examinations- direct smear method, simple sedimentation and floatation methods, quantitative faecal examination, pastural larval counts). Examination of skin scrapings, examination of blood. Orientation to a clinical Microbiology laboratory, collection, transport and processing of specimens from clinical cases for diagnosis of important bacterial, fungal and viral diseases. Isolation of bacteria from clinical samples, identification of bacteria by Grams staining and cultural or biochemical characteristics. Drug sensitivity and rationale for therapy. Diagnosis of diseases by employing tests like Agar Gel precipitation Test, ELISA etc.

**Note:** The Laboratory shall run in collaboration with the Department of Pathology and Physiology and Biochemistry. Biochemist appointed in this section will be involved in teaching of students regarding principles of various diagnostic tests, normal and abnormal values in different species, differential diagnosis, correlating with diseases and rationale of arriving at the conclusion.

**Medicine Section:**
Orientation and understanding the working of Veterinary Clinics including hospital set up, administration and workforce management. Understanding the different methods of record keeping, retrieval, processing, analysis and interpretation of data. Involvement in outpatient department (OPD), Indoor patient, Critical care or intensive care unit, sanitation, practice management etc. Doctor client interaction: Orientation to local language or dialect or local terminology of the diseases. Registration, filling up registration cards, clinical practice comprising of clinical examination of the patient, with emphasis on history taking, examination techniques- palpation, percussion and auscultation. Familiarization
and practice of first aid procedures and emergency medicine. Practice of collection, labeling, packaging and evaluation of laboratory samples. Relating generic and trade names of drugs along with their doses, indications and contraindications to prescribed treatment regimens. Systematic examination of various systems, recording of clinical observations viz. temperature, respiration, pulse, cardiac sounds, cardiac function, pulmonary function, functional motility of digestive system, routes and techniques of administration of medicaments. Tentative and confirmatory diagnosis and treatment of common clinical cases like pharyngitis, laryngitis, stomatitis, indigestion, gastritis, ruminal impaction, tympany, enteritis, traumatic reticulo-peritonitis, traumatic pericarditis, pneumonia, haemoglobinuria, haematuria. milk fever, ketosis, rickets, osteomalacia, common poisoning, and others clinical cases as reported in the section. Collection of materials like urine, faeces, skin scraping, blood, milk and other body fluids for laboratory tests. Preparation of case records; follow-up records etc. Readiness to treat and handle causalities and other emergencies in the clinics. Learning and practicing passing of stomach and naso-gastric tube. Screening of livestock or poultry through tests, mass diagnostic campaigns. Vaccination and other disease prevention and control programmes in the field. Learning the use of various advance non invasive diagnostic aids like Ultrasonography, Ophthalmoscope etc. Practice of feeding of sick animals. Acts and regulations pertaining to generation and disposal of biomedical wastes in veterinary institutions. Biomedical waste generation, handling, storage, sorting, coding, transportation and disposal. Hazards of biomedical waste, and impact of biomedical waste on the environment.

**Gynecology and Obstetrics Section**

Practice of artificial insemination, pregnancy diagnosis, clinical examination and management of cases of anoestrus, silent oestrus, infertility and conception failure. Treatment of cases of metritis, cervicitis, vaginitis etc. Handling and management of cases of retention of placenta or fetal membranes, ante and post partum prolapse of vagina. Examination and handling of cases of dystocia, fetotomy, caesarian etc. Castration of male calves, breeding soundness, evaluation of bulls, ovariohysterectomy and collection of cervical and vaginal mucus for cytology. Rectal examination and vaginal examination of genitalia. Familiarization with common drugs and hormones used in reproductive disorders including infertility, epidural and local anaesthesia for gynaecological cases. Filling of clinical case records and their maintenance.

**Surgery and Radiology Section**

Familiarization and understanding the use of equipments used in surgical sections of the VCC. Restraining and positioning of different species of animals for examinations, diagnosis and surgical treatment. Prescription of common drugs, their doses and uses in clinical surgical practice. Filling of clinical case records and their maintenance. Preparation and sterilization of surgical packs, instruments, drapes and operation theaters. Passing of stomach tube and gastric tube. Catheterization and urine collection. Techniques of examination of neuromuscular and skeletal functions, Familiarisation with antiseptic dressing techniques, bandaging, abdomino-centesis, thoracocentesis. Topography anatomy of animals. Radiographic positioning, terminology and interpretation. Treatment and Management of various surgical conditions including inflammation, wounds, abscess, cysts, tumors, hernia, haematoma, hemorrhage, sinus, fistula, necrosis, gangrene, bum, sprain, tendinitis etc. Management and treatment of fractures, dislocations and other affections
of joints, facial paralysis, Eye worm and other affections of Eye.
Irregular teeth and their rasping, tail amputation, knuckling, upward fixation of patella (medical patellar desmotomy) etc. Familiarisation with the landmarks for the approach to various visceral organs, thoraco-centesis, abdominocentesis. Rumenotomy, laparotomy, palpation and visualisation of viscera, urethrotomy, castration, vasectomy, caudectomy, thoracotomy, cystotomy, cystorrhaphy and spleenectomy. Examination of horse for soundness, lameness and preparation of certificate for soundness. Tenotomies, sutting of tendon, shortening of tendon.

**Pet Animal Section**
Registration, filling up registration cards, history taking. Relating generic and trade names of drugs alongwith their doses, indications and contraindications to prescribed treatment regimens. Familiarization and practice of first aid procedures and emergency medicine. Practice of collection, labeling, packaging and evaluation of laboratory samples. Clinical examination techniques- palpation, percussion and auscultation, systematic examination of various systems, recording of clinical observations viz. temperature, respiration, pulse, cardiac sounds, cardiac function, pulmonary function, functional motility of digestive systems. Routes and techniques of administration of medicaments. Diagnosis and treatment of diseases. Collection of materials like urine, faeces, skin scraping, blood, milk and other body fluids for laboratory tests. Preparation of case records; follow-up records etc. Vaccination and other disease prevention and control programmes. Practice of pregnancy diagnosis, examination of cases of anoestrus, silent oestrus and conception failure. Rectal examination of genitalia, vaginal examination. Epidural and local anaesthesia for gynaecological cases. Resteraining and positioning techniques for examination, diagnosis and surgical treatment. Preparation of surgical packs, sterilization procedures for surgical instruments. Passing of stomach tube and gastric tube. Catheterization and urine collection. Familiarization with antiseptic dressing techniques. Topography anatomy of pet animals. Radiographic positioning and terminology. The practical component will be dealt with internally. The examination for VCP shall be conducted twice a year i.e. first practical exam after completion of 50% syllabus and the second one, when the course is completed but the second exam shall comprise of entire syllabus. Annual professional examination shall be held after the completion of 100% course content in each subject.

**The examination should comprise of following components:**

(i) Submission of 10 complete cases each of Surgery, Medicine, Gynaecology
(ii) Case presentation
(iii) Review of treatment of 5 cases
(iv) Written Objective Questions (Surgery, Medicine, Gynaecology and Lab diagnosis)
(v) Viva
LIVESTOCK FARM COMPLEX

LIVESTOCK FARM PRACTICES  (Third year)  Credit hours : 0+2

Aim of Livestock farm practices is actual involvement of students in all aspects of animal rearing so that they can rear animals on their own. Hands on training of the students on the overall farm practices of livestock management including cleaning, feeding, watering, grooming, milking, routine health care, record keeping, sanitation, housing, fodder production, preparation of mineral mixture, cost economic of fodder production. Care of pregnant animals, management of parturition, care of neonatal and young stock. Management of broiler, layer farm and hatchery. One full day per week comprising of six contact hours will be kept entirely for LFP where the students should be divided into small batches on rotational basis wherein they should be actually involved in different activities such as milking, feeding etc. The practical component will be dealt with internally. The examination for LFC shall be conducted twice a year i.e. first practical exam after completion of 50% syllabus and the second one, when the course is completed but the second exam shall comprise of entire syllabus. Annual professional examination shall be held after the completion of 100% course content in each subject.

The examination should comprise of following components:

(i) Day to day activities
(ii) Record Book
(iii) Written Objective Questions
(iv) Viva Any other suitable component as per conditions
(xv) DEPARTMENT OF VETERINARY SURGERY AND RADIOLOGY

VETERINARY SURGERY AND RADIOLOGY  Credit Hours: 2+1

THEORY - UNIT-1 (VETERINARY GENERAL SURGERY)

patients.

UNIT-2 (VETERINARY ANAESTHESIOLOGY)
Introduction: Development of anaesthesiology, Terminology, classification and indications. General considerations of anaesthesia: Factors affecting anaesthesia and selection of anaesthetic technique, factors modifying uptake, distribution and elimination, patient evaluation, categories of patients according to physical status, selection of anaesthetic agent and patient preparation. Pain and its management in animals. Local and regional anaesthesia: Definitions, local anaesthetics, mechanism of action. Premedication, properties and use of different preanaesthetics: Uses of premedication, Anticholinergic, sedatives and tranquilizers (Phenothiazine derivatives, Benzodiazepines, Butyrophenones, Narcotic analgesics, Alpha-2 agonists, dosage chart of all the drugs. General anaesthesia: Definitions, methods of induction of anaesthesia, Intravenous anaesthetics (Total intravenous anaesthesia), monitoring of anaesthesia. Inhalation anaesthesia: Advantages of inhalant anaesthetics, types of inhalant anaesthetics their properties and effect on various systems, methods of administration of inhalant anaesthesia. Dissociative anaesthesia: Definition, drugs, clinical application, properties and effect on various body systems. Avian, wild, zoo, exotics and lab animal anaesthesia and capture myopathy. Anaesthetic emergencies and management, Toxicity, antidote and reversal agents.

UNIT-3 (VETERINARY DIAGNOSTIC IMAGING TECHNIQUES)
Introduction to Radiology-General terminology of radiology, Physical properties of X-Rays, Scope and uses of Radiology, Directional terms for veterinary radiology. Production of X-rays and factors influencing production of X-rays. Radiation hazards and safety measures- Scattered radiation, Biological effects of radiation, Direct and indirect effects, Early and late effects, Radiation sensitivity of different body cells, Radiation protection, General principles of radiation safety, Radiation monitoring devices, Requirement of an ideal radiographic section. The statutory requirements of radiology set-up as per Atomic Energy Regulatory Board of India (AERB). Production of quality diagnostic radiograph. Recording of image- Manual and digital processing of X-ray films, storage and retrieval system. Radiographic Quality and faults- Radiographic detail, density and contrast and factors affecting them, Radiographic faults, their possible causes and prevention. Contrast radiography- Definition, indications, contraindications and types of contrast radiography, Different contrast materials and their use, Techniques of some selected contrast radiography in animals (Barium swallow, Retrograde urography etc) Diagnostic ultrasonography- Principles, indications, techniques and artifacts of ultrasonography. Advanced diagnostic imaging tools- The brief introduction to the use and limits of some advanced imaging techniques, Interventional radiology - CAT scanning, MRI, etc

UNIT-4: (REGIONAL SURGERY-I)

UNIT-5: (REGIONAL SURGERY-II)
UNIT-6 (ORTHOPEDICS AND LAMENESS)
Body conformation of the horse in relation to lameness (trunk, fore limb and hind limb). Lameness: Its
definition classification and diagnosis. General methods of therapy for lameness. Body and limb
conformation in relation to lameness in equine. Equine lameness: Shoulder slip (sweeny), bicipital
bursitis, omarthritis, capped elbow, radial paralysis, carpiris, bent knee, and knock-knee. Hygroma of
knee, open knee, blemished knee. Fracture of carpal bone, fracture of accessory carpal, contraction of
digital flexors. Splints, sore shin, wind puffs, sesamoid iris Ostitis, ringbone, quittor, side bone,
Navicular disease, pyramidal disease. Laminititis, sand crack, seedy toe, fractures of third phalanx, pedal
osteitis, and sole penetration. Canker, thrush and corn, Monday morning disease, cording up, myositis of
psoas, Mac thrombosis, Crural paralysis, subluxation of sacroiliac joint rupture of round ligament
trochantric bursitis. Upward fixation of patella, stringhalt, gonitis, chondromalacia of patella, rupture of
tendochilhes, rupture of peroneus tertius, fibrotic myopathy and ossifying myopathy. Thoroughpin, bog
spavin, spavin, curb, capped hock. Canine lameness: Intervertebral disc diseases, elbow and hip dysplasia,
rupture of cruciate ligament, elbow hygroma etc.; their management, Onychectomy. Bovine lameness:
Contusion of sole, ulceration of sole, septic laminititis, avulsion of hoof and subluxation of patella,
interdigital fibroma, cyst, sand crack, and hoof deformities. Fracture: Definitions, classification, fracture
healing and complications. Fracture: The preliminary assessment and management of fractures. Techniques
of external immobilization of fractures. Techniques of internal immobilization of fractures. Management of
fracture complications Luxations: Definition, signs, diagnosis. Management of common joint luxations in
animals. Spinal trauma, diagnosis and its management Rehabilitation and physiotherapy of orthopaedic
patients

PRACTICAL

UNIT-1 (VETERINARY GENERAL SURGERY)
Introduction to layout of operation theatre and surgical unit. Introduction of common surgical
equipment and instruments. Suture materials, surgical knots and suture patterns. General examination of
surgical patients. Preparation of surgical patients. Other operation theatre routines like sterilization,
preparation of theatre, Surgeon and surgical pack. Bandaging and basic wound management
Demonstration (or Audio visual aids) of surgery, control of haemorrhage and suturing

UNIT-2 (VETERINARY ANAESTHESIOLOGY)
Familiarization with anaesthetic apparatus, monitoring equipment and accessories. Methods of local
infiltration analgesia (Linear ring block, inverted L block etc.) Regional nerve block demonstration
and practice (Auriculopalpebral block, Peterson block or 4 point retrobulbar nerve block, Paravertebral,
epidural etc.) Intravenous regional anaesthesia in cattle. Administration of general anaesthesia in small and
large animals. (Demonstration and practice). Administration of
inhalant anaesthesia (Demonstration). Monitoring of general anaesthesia. Management of anaesthetic
emergencies, use of artificial respirator and analeptics. Visit to a wild animal facility or audio-visual aids or
both.
UNIT-3 (VETERINARY DIAGNOSTIC IMAGING TECHNIQUES)
Familiarization with the operation of the x-ray unit. Formulation of X-ray exposure technique charts, Adoption of safety measures and film processing. Positioning and radiography of different parts of the body in small and large animals. Handling, viewing and interpretation of radiograph. Familiarization with the film contrast, density and details, common radiographic artifacts. Radiographic pathology of the head, neck and thorax of large and small animals. Radiographic pathology of abdomen of large and small animals. Radiographic pathology of the bones and joints of large and small animals. Demonstration of contrast radiographic techniques in animals. Demonstration of ultrasonography in animals. Fluoroscopy or Image intensifier (familiarization).

UNIT-4: (REGIONAL SURGERY-I)
Demonstration or Audio visual aids: Amputation of horn and disbudding. Tooth rasping, dental scaling. Examination of ear (otoscopy). Examination of eye (General examination, Ophthalmoscopy, tonometry, fluorescein dye test, Scherimer tear test, test for blindness). Operation for aural haematoma. Protection and bandage of eyes, tarsorrhaphy, third eyelid flap, flushing of nasolacrimal duct

UNIT-5: (REGIONAL SURGERY-II)

UNIT-6 (ORTHOPEDICS AND LAMENESS)
Demonstration or Audio visual aids-Familiarization with various orthopaedic instruments and implants. Basic orthopaedic and neurological examination in small and large animals. Nerve blocks in equine. Application of basic physiotherapy techniques in animals. Basic limb stabilization techniques and splinting techniques. Application of cast in small and large animals. Internal fixation techniques in animals. Medial patellar desmotomy in bovines. Examination of animals for soundness and preparation of soundness certificate.

ANNUAL EXAMINATION

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DEPARTMENT OF VETERINARY MEDICINE

VETERINARY MEDICINE

Credit Hours: 4+1

THEORY

UNIT-1 (GENERAL)


UNIT-2 (SYSTEMIC DISEASES)

Etiology, clinical manifestations, diagnosis, differential diagnosis, treatment, prevention and control of the following diseases of cattle, buffalo, sheep, goat, horse, pig, dog, cat and poultry: Diseases of digestive, respiratory, cardiovascular, urinary, nervous, musculoskeletal, haemopoietic, and lymphatic systems, skin, sense organs including affections of peritoneum, liver and pancreas. Emergency medicine and critical care.

UNIT-3 (METABOLIC AND DEFICIENCY DISORDERS)

Diagnosis and management of diseases caused by deficiency of iron, copper, cobalt, zinc, manganese, selenium, calcium, phosphorus, magnesium, iodine, vitamin A, D, E, B complex, K and C. Diseases of neonates, Alternative or integrated or ethno veterinary medicine in animal disease management. Aetiology, clinical manifestations, diagnosis, differential diagnosis, treatment prevention and control of metabolic or production and endocrine diseases of cattle, buffalo, sheep, goat, horse, pig, dog, cat and poultry i.e. Milk fever, eclampsia, osteodystrophy fibrosa, lactation tetany, downer cow syndrome, ketosis, fat cow syndrome, hypomagnesaemia, Nutritional haemoglobinuria, azoturia, diabetes, hypothyroidism, Cushing syndrome, Addison’s disease and Gout.

UNIT-4 (ZOO AND WILD ANIMAL MEDICINE)

Principles of zoo hygiene, public health problems arising from zoos. Prevention, control and treatment of infectious, parasitic, nutritional and metabolic diseases in zoo and wild animals including exotic birds. Acts and Rules related to Zoo and wild animals. National and international organizations and institutions interlinked to wild and zoo animals – role and functioning.

UNIT-5 (BACTERIAL, FUNGAL AND RICKETTSIAL DISEASES)

Aetiology, epidemiology, clinical manifestations, diagnosis, treatment, prevention and control of bacterial, fungal and rickettsial diseases of livestock: mastitis, hemorrhagic septicaemia, brucellosis, tuberculosis, Johne's disease, listeriosis, leptospirosis, campylobacteriosis, actinomycosis, enterobactillosis, bordetellosis, glanders, strangles, ulcerative lymphangitis, colibacillosis, fowl typhoid, pullorum disease, fowl cholera, avian mycoplasmosis, spirochaetosis, salmonellosis, swine erysipelas, contagious caprine pleuropneumonia, contagious bovine pleuropneumonia, anthrax, clostridial infections, ehrlichiosis, chlamydiosis, Q fever, anaplasmosis, dermatophilosis, aspergillosis, candidiasis, histoplasmosis,
UNIT-6 (VIRAL AND PARASITIC DISEASES)
Aetiology, epidemiology, clinical manifestations, diagnosis, treatment, prevention and control of viral and parasitic diseases of diseases of cattle, buffalo, sheep, goat, horse, pig, dog, cat and poultry: Foot and mouth disease, rinderpest, bovine viral diarrhoea, malignant catarrhal fever, infectious bovine rhinotracheitis, ephemeral fever, blue tongue, sheep pox, goat pox, PPR, classical swine fever, rabies, equine influenza, equine infectious anemia, equine rhinopneumonitis, canine distemper, infectious canine hepatitis, canine paroviral disease, corona viral infection, adeno virus infection, feline rhinotracheitis, feline panleucopenia, feline infectious peritonitis, avian influenza, New Castle disease, Marek's disease, avian leucosis, infectious bronchitis, infectious laryngotracheitis, avian encephalomyelitis, chicken reo virus, fowl pox, infectious bursal disease, chicken infectious anemia, inclusion body hepatitis-hydropericardium syndrome, emerging and exotic viral diseases of global importance. Parasitic diseases: Trematodes, cestodes, nematodes, protozoan infections and external parasites of clinical importance.

UNIT-7 (JURISPRUDENCE, ETHICS, AND ANIMAL WELFARE)

PRACTICAL
UNIT-1 (GENERAL)
UNIT-2 (SYSTEMIC DISEASES)

UNIT-3 (ZOO AND WILD ANIMAL MEDICINE)
Management and restraint of zoo and exotic animals. Drug delivery in zoo and wild animals. Visit to Zoo or Sanctuary. Examination of veterelegal cases.

UNIT-4 (BACTERIAL, FUNGAL AND RICKETTSIAL DISEASES)
PRACTICALS

UNIT-5 (VIRAL AND PARASITIC DISEASES)
Collection and examination of skin scrapings- Parasitic, fungal, bacterial. Examination of blood for parasites. Dark field microscopy. Application of Molecular and serological techniques or clinical samples for diagnosis of viral and parasitic diseases.

ANNUAL EXAMINATION

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(xvii) DEPARTMENT OF VETERINARY GYNAECOLOGY AND OBSTETRICS

VETERINARY GYNAECOLOGY AND OBSTETRICS Credit Hours 2+1

THEORY

UNIT- 1 (VETERINARY GYNAECOLOGY)
Bovine : Applied clinical anatomy and embryology of female reproductive tract - Hereditary and congenital anomalies of female reproductive tract –Puberty and sexual maturity and their endocrine control- Delayed puberty- Its causes, clinical approach, treatment and prevention of delayed puberty- Applied reproductive physiology and endocrinology of oestrous cycle- Oestrous cycle and factors affecting the length of the

UNIT-2 (VETERINARY OBSTETRICS)
Farm and pet animals - Maternal recognition of pregnancy – Applied Endocrinology of pregnancy – Pregnancy diagnosis - Duration of pregnancy - Factors affecting gestation length - Care and management of pregnant animals - Implantation, Placentation - Classification, functions – Wander of ovum - Telegony - Superfetation and Superfecundation – Clinical management of specific and non-specific causes of abortion, extra uterine pregnancy, dropy of fetal membranes and fetus, mummification, maceration, cervicovaginal prolapse, uterine torsion and hysterocoele. Parturition - Signs of approaching parturition - Stages of parturition - Initiation and induction of parturition - lactational disorders - Puerparium and factors affecting puerparium - Postpartum care of the dam and neonate in different species of farm and pet animals - Dystocia - Classification - Clinical signs and diagnosis - Handling of Fetal and maternal dystocia – Obstetrical interventions - Mutation – Forced extraction – Fetotomy – Cesarean section in small and large animals – Maternal obstetrical paralysis - Retention of fetal membranes, Total uterine prolapse and common metabolic diseases of puerperal period – Post partum hemorrhage – Sub involution of placental sites - Injuries incident to parturition - Post partum uterine infections – Post partum resumption of ovarian activity.
UNIT 3 (VETERINARY ANDROLOGY AND A.I.)

Farm and pet animals - Comparative clinical reproductive anatomy and endocrinology of the male reproduction - Common congenital and genetic defects of the male reproductive tract – Puberty and sexual maturity and factors affecting them - Sexual behaviour and libido - Sperm transport, erection and ejaculation - Coital injuries and vices in male animals - Semen and ejaculate – Semen collection techniques- Structure of Spermatozoa - Semen evaluation - Semen extenders, dilution, preservation and post thaw evaluation - Artificial insemination techniques in farm and pet animals - Forms of male infertility - Impotentia coeundi and impotentia generandi – Affections of the scrotum, testis, accessory sex glands, penis and prepuce - Breeding soundness evaluation of bull – In vitro tests for evaluation of male fertility - Medical and surgical techniques for population control of the male reproduction – Surgical procedure on the male reproductive tract in farm and pet animals.

PRACTICAL

UNIT-1 (VETERINARY GYNAECOLOGY)

Study of female genital organs using slaughter house specimens- Oestrus detection aids - Techniques of rectal palpation of female reproductive tract - Gynaecological equipment and instruments - Vaginal exfoliative cytology and vaginoscopy - Ultrasonography of female reproductive tract - Surgical procedures on the vulva, vagina and uterus-Study of pathological specimens of female genital tract- Demonstration and practice of ovario-hysterectomy and panhysterectomy - Diagnostic procedures in investigation of infertility in female animals

UNIT-2 (VETERINARY OBSTETRICS)


UNIT-3 (VETERINARY ANDROLOGY, AI AND ASSISTED REPRODUCTIVE TECHNIQUES)

Study of male genital organs using slaughter house specimens- Techniques of rectal palpation of the male reproductive tract- Andrological and AI equipment - Vasectomy and castration - Surgical procedures on penis, prepuce and scrotum- Planning and organization of AI centre-Preparation of teaser animals - Selection, care, training and maintenance of male animal used for breeding purpose-Techniques of semen collection-Semen evaluation techniques – Sterilization, storage of equipment used for semen collection and Artificial insemination-Preparation of extenders and extension of semen-Preservation of semen-Thawing of semen and technique of AI-Handling and maintenance of LN2 containers. Diagnostic procedures in investigation of infertility in male animals-Breeding soundness evaluation of bulls- Oestrus synchronization procedures- Multiple Ovulation and Embryo Transfer- In Vitro Fertilization
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Annexure – I

(NAME OF THE DEGREE AWARDING UNIVERSITY)

SEAL

TRANSCRIPT

Name: ------------------------------------------
Father’s Name:  
Mother’s Name: -----------------------------------------
Name of the College: ____________________
Degree Programme: Bachelor of Veterinary Science and Animal Husbandry (B.V.Sc. & A.H.)

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Grand Total of Credit Hours:  81

Grand Total of Credit Points: 604.60

( NC) Non Credit Hours:    2

Over All Grade Point Average (OGPA): 7.460 out of 10.00

Percentage of Marks: 74.60%

RESULT: PASSED WITH FIRST DIVISION

CONDUCT: SATISFACTORY

*Cleared with Compartment

**Failed in First or Second or Third or Fourth year

***Internship extended or repeated

DATE:

Assistant Registrar (Academic)

Signature with Seal

(Overleaf)

Calculation of Grade Point (GP), Credit Point (CP), Grade Point Average (GPA) & Overall Grade Point Average (OGPA)

- GP in a subject will be the total marks obtained by a student out of 100 divided by 10.
- CP in a subject will be GP multiplied by the credit hrs.
- GPA = Sum of the total credit points earned divided by the sum of credit hrs.
- OGPA = Sum of the grand total credit points earned divided by the grand sum of credit hrs.
- Percentage of Marks = OGPA multiplied by 10
NOTE:

1. Evaluation

Overall performance of the student in various examinations including the internal and annual examination by securing 50% in theory and practical separately shall be the criterion of passing or failing in a subject. A student is required to secure an aggregate of 50% marks in theory and an aggregate of 50% marks in practical to be declared to have passed in a subject. If a student fails in two subjects only, he or she is eligible to appear in the compartment examination of those subjects which shall include the components of annual theory and practical examination only.

2. Division

<table>
<thead>
<tr>
<th>Division</th>
<th>OGPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass</td>
<td>5.000-5.999</td>
</tr>
<tr>
<td>Second Division</td>
<td>6.000-6.999</td>
</tr>
<tr>
<td>First Division</td>
<td>7.000-7.999</td>
</tr>
<tr>
<td>First Division with Distinction*</td>
<td>8.000 and above</td>
</tr>
</tbody>
</table>

3. In case a student has passed a subject through compartment examination, the same be mentioned against the particular subject in the transcript.
4. In case a student fails in a particular year, the same be mentioned in transcript.
5. If the internship is extended or repeated, the same be mentioned in transcript.
Annexure-II

Serial.No __________
Admn.No: ___________

______________________________________________________________________

(NAME OF THE DEGREE AWARDING UNIVERSITY)

SEAL

DETAILED MARKS CERTIFICATE
FIRST PROFESSIONAL (B. V. Sc. & A. H.)

Name: ________________________________ Father’s Name: ________________________________

Mother’s Name: ___________________________ Academic Year: ______________________________

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Hrs</th>
<th>Internal Assessment</th>
<th>Marks obtained</th>
<th>Grade Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hrs.</td>
<td>First (10)</td>
<td>Second (10)</td>
<td>Theory (40)</td>
</tr>
<tr>
<td>Veterinary Anatomy</td>
<td>4+3</td>
<td>7.0</td>
<td>6.0</td>
<td>25.0</td>
</tr>
<tr>
<td>Veterinary Physiology</td>
<td>4+1</td>
<td>6.5</td>
<td>7.5</td>
<td>28.0</td>
</tr>
<tr>
<td>Livestock Production Management</td>
<td>4+2</td>
<td>7.5</td>
<td>7.0</td>
<td>30.0</td>
</tr>
<tr>
<td>NCC or NSS or CCA</td>
<td>0+1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(NC)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CURRENT: Total Credit Hrs: 18  Total Credit Points Earned: 151.30 GPA: 7.204
CUMMULATIVE: Total Credit Hrs:  
Total Credit Points Earned:  
OGPA: 7.204 out of 10.00

RESULT:
1. Pass with Grade Point Average (GPA)
2. * Cleared with compartment.
3. Fail

Assistant Registrar (Academic)
for Registrar

Calculation of Grade Point (GP), Credit Point (CP), Grade Point Average (GPA) & Overall Grade Point Average (OGPA)

- GP in a subject will be the total marks obtained by a student out of 100 divided by 10.
- CP in a subject will be GP multiplied by the credit hrs. The credit points earned will be zero if the GP in a subject is less than 5.00)
- GPA = Sum of the total credit points earned divided by the sum of credit hrs.
- OGPA = Sum of the grand total credit points earned divided by the grand sum of credit hrs.