

**UNIT-I**

**ANIMAL EXPERIMENTATION IN INDIA:** History, Animals used in India in scientific and industrial research; Ethical issue in use of animals for scientific research - categories of animals used in scientific research, necessity of the animal in studies, scale of studies and related ethical issues and regulations; Legal issues related to animal experimentation - national and international legal regulations in scientific studies and development studies and its implications in pharmaceutical industries; Guidelines for care and use of animals in scientific research - basic guidelines for housing, maintenance of hygiene and health, regulatory approvals from statutory body and basic guidelines.

**UNIT - II**

**ANIMAL MODELS IN MEDICAL EDUCATION AND RESEARCH:** Basic animal models in medical education to understand anatomy and physiology of human body, Animal models used in medical research - guinea pigs, murine /rodent and primate models; Animal models in pharmaceutical Research - animal models used in pharmaceuticals studies for evaluation of toxicity and tolerance of novel drugs and drug derivatives, animal models in drug development; Animal models - murine, rodents and guinea pigs, dogs, horse, primates in drug development studies in evaluation of drug tolerance, efficacy and toxicity; Animal models in preclinical studies/trials - prerequisites of planning, pre-clinical studies and trials, animal models such as rodents, dogs, guinea pigs and horse used in preclinical studies.

**UNIT-III**

**PRIMATES IN BIOMEDICAL RESEARCH:** Primates in biomedical research, Drug development, Biometry and biosensor development and evaluation of physiological parameters in living organism; Product efficacy evaluation; Primates use in brain function and structure evaluation research; Imaging and biochemical quantification of vital parameters; Psychedelic and neurotrophic drug assessment studies.

**UNIT-IV**

**LABORATORY ANIMALS IN DEVELOPMENT OF VETERINARY BIOLOGICALS AND PHARMACEUTICALS:** Models like chicken, guinea pig, horse in development of live-stock biologics, vaccines and evaluation of efficacy, toxicity of small molecules and drugs.

**UNIT-V**

**ANIMALS FOR TEACHING AND RESEARCH IN EDUCATIONAL INSTITUTIONS:** Animal models like rodents (rats/mouse), drosophila, daphnia, cockroach, dogs, bovines etc in teaching and education; Alternatives to the experimental animals in biomedical research and testing - optimizing animal use-refinement and reduction; Development of animal free artificial bio-mimicking culture and tissue systems, 3D-cultures.