(B. Pharm.)

(Semester - VIII)

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Course Code	BP810ET
Course Title	Experimental Pharmacology-Theory

Scope:

This subject is designed to impart the basic knowledge of preclinical studies in experimental animals including design, conduct and interpretations of results.

Objectives:

Upon completion of this course the student should be able to –

1. Appreciate the applications of various commonly used laboratory animals.
2. Appreciate and demonstrate the various screening methods used in preclinical research.
3. Appreciate and demonstrate the importance of biostatistics and research methodology.
4. Design and execute a research hypothesis independently.

Course Learning Outcomes (CLO):

At the end of the course, students will be able to -

12. Outline basics techniques and regulatory guidelines of experimentation on animals.
13. Construct investigational design of experiments on animal.
14. Explain preclinical screening models for diuretics, anti-pyretic, anti-inflammatory and CNS activity.
15. Select preclinical screening model for ANS activity and local anaesthetics.
16. Choose preclinical screening model for CVS activity, anti-ulcer, anti-diabetic anti-asthmatics and anti-cancer.
17. Elaborate research hypothesis, study design and interpret pre-clinical data using various statistical tools.

Syllabus: **Teaching hours: 45 Hours**

UNIT I **08 Hours**

Laboratory Animals:

Study of CPCSEA and OECD guidelines for maintenance, breeding and conduct of experiments on laboratory animals, common lab animals: description and applications of different species and strains of animals. Popular transgenic and mutant animals.

Techniques for collection of blood, common routes of drug administration and euthanasia in laboratory animals.

UNIT II **10 hours**

Preclinical screening models– Introduction: dose selection, calculation and conversions, preparation of drug solution/suspensions, grouping of animals and importance of sham negative and positive control groups. Rationale for selection of animal species and sex for the study, Translational research aspect on animal model.

Study of preclinical screening animal models for- Diuretics, antipyretic, anti-inflammatory, CNS activity (analgesic, general anaesthetics, sedative and hypnotics, antipsychotic, antidepressant, antiepileptic, anti-parkinsonism, Alzheimer's disease/nootropics)

UNIT III **07 Hours**

Preclinical screening models for- ANS activity **(**sympathomimetics, sympatholytics, parasympathomimetics, parasympatholytics, skeletal muscle relaxants, drugs acting on eye) and local anaethetics.

15 hours

UNIT IV

Preclinical screening models for- CVS activity (antihypertensive, diuretics, anti-arrhythmic, anti-dyslipidemic), anti-aggregatory, coagulants, and anticoagulants.

Preclinical screening models for other important drugs- antiulcer, anti-diabetic, anticancer and anti-asthmatics.

UNIT V **05 Hours**

Research methodology and Bio-statistics

Selection of research topic, review of literature, research hypothesis and study design. Pre-clinical data analysis and interpretation using Student's t-test and one-way ANOVA. Graphical representation of data, Dose selections, factors for converting animal dose to human dose and FDA guidelines for effective human dose calculation (NOAEL)

Tutorials Teaching hours: 15 Hours

Tutorials will be based on above syllabus

Suggested Readings^: (Latest Edition)

1. Ghosh M. N., Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
2. Kulkarni S. K., Handbook of Experimental Pharmacology. Vallabh Prakashan, New Delhi.
3. Goyal R. K., Mehta A. A., Balaraman R., Burande M. D., Dearsari and Gandhi's Elements of Pharmacology. B.S. Shah Prakashan, Ahmedabad.
4. CPCSEA guidelines for laboratory animal facility.
5. Vogel H.G., Drug discovery and Evaluation. Springer, Verlag Berlin Heidelberg New York.
6. Gupta S. K., Drug Screening Methods. Jaypee Brothers Medical Publishers, New Delhi.
7. Sundar Rao P. S. S., Richard J., Introduction to biostatistics and research methods. Phi Learning Private limited, New Delhi.

L= Lecture, T= Tutorial, P= Practical, C= Credit

^ this is not an exhaustive list