INSTITUTE	**FACULTY OF PHARMACY**
PROGRAM	**BACHELOR OF PHARMACY**
SEMESTER	**8**
COURSE TITLE	**EXPERIMENTAL PHARMACOLOGY**
COURSE CODE	**13PH0810**
COURSE CREDITS	**4**

Objective:

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

Course Outcomes: After completion of this course, student will 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.

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

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	1	0	75	15	10	0	0

Contents : Unit	Topics	Contact Hours
1	**Laboratory animals:** 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 and common routes of drug administration in laboratory animals, Techniques of blood collection and euthanasia.	7
2	**Introduction to preclinical studies** Introduction to preclinical studies: Dose selection, calculation and conversions, preparation of drug solution/suspensions, a grouping of animals and importance of sham negative and positive control groups. The rationale for the selection of animal species and sex for the study.	3

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Contents : Unit	Topics	Contact Hours
3	**Preclinical screening models for drugs acting on CNS:** Preclinical screening models for drugs acting on CNS: Analgesic, antipyretic, anti-inflammatory, general anaesthetics, sedative and hypnotics, antipsychotic, antidepressant, antiepileptic, nootropics anti Parkinsonism drugs, anti-Alzheimer drug Preclinical screening models for drugs acting on the eye and local aesthetics.	12
4	**Preclinical screening models for drugs acting on ANS** Preclinical screening models for drugs acting on ANS: Sympathomimetics, sympatholytics, parasympathomimetics, parasympatholytics, skeletal muscle relaxants.	5
5	**Preclinical screening models for drugs acting on CVS** Preclinical screening models for drugs acting on CVS: Antihypertensives, diuretics, antiarrhythmic, anti- dyslipidemic, antiaggregatory, coagulants, and anticoagulants Preclinical screening models for antiulcer, antidiabetic, anticancer and antiasthmatic activities.	13
6	**Research methodology and bio-statistics:** Research methodology and bio-statistics: Selection of research topic, review of literature, research hypothesis and study design Pre-clinical data analysis and interpretation using Students‘t’ test and One- way ANOVA. Graphical representation of data.	5
Total Hours		**45**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Tutorials** Tutorial 1, Tutorial 2, Tutorial 3, Tutorial 4, Tutorial 5, Tutorial 6, Tutorial 7, Tutorial 8, Tutorial 9, Tutorial 10, Tutorial 11, Tutorial 12, Tutorial 13, Tutorial 14, Tutorial 15	15
Total Hours		**15**

Textbook :

1 Fundamentals of Experimental, Pharmacology , by M. N. Ghosh., 2015

References:

1 Handbook of Experimental Pharmacology by S. K. Kulkarni.
2 CPCSEA guidelines for laboratory animal facility.
3 Drug discovery and Evaluation by Vogel H.G.
4 Drug Screening Methods by Suresh Kumar Gupta and S. K. Gupta.
5 Introduction to biostatistics and research methods by PSS Sundar Rao and J Richard.

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
20.00	30.00	25.00	15.00	10.00	0.00

Instructional Method:

1 The course delivery method will depend upon the requirement of content and the need of students. The teacher in addition to the conventional teaching method by the blackboard may also use any tools such as demonstration, role play, quiz, brainstorming, MOOCs etc.

2 The internal evaluation will be done based on continuous evaluation of students in the laboratory and classroom.

3 Students will use supplementary resources such as online videos, NPTEL videos, MOOCs/ e-courses, virtual laboratories.

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