Subject Code: 1PH2000301	**Subject Title:** Experimental Design and Patents
Pre-requisite Subject	**- NONE -**

Objectives of course:

The student will be familiar with, how to design an experimental study, carry out an appropriate statistical analysis of the data, and properly interpret and communicate the analyses. They will also understand various intellectual property rights and their application in to research work.

Learning outcomes:

At the end of semester student will be able to:

- Understand the process of designing an experiment including factorial and fractional factorial designs.
- Examine how a factorial design allows cost reduction, increases efficiency of experimentation, and reveals the essential nature of a process.
- Understand the role of response surface methodology and its basic underpinnings.
- Provide basic knowledge and awareness on the concept and to understand the national and international legal framework to protect patents.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)					
				Theory(T)		Practical(P)		Total Marks	
Lecture	Tutorial	Practical	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Theory	Practical
4	NA	NA	8	80	20	NA	NA	100	NA

Subject Contents			
Sr. No.	Topic	Total Hours	Weight (%)
1	**Experimental Designs:** Introduction to full and fractional factorial designs, Central composite designs, Evolution of full and reduced mathematical models in experimental designs, Applications of the experimental designs for the subject mentioned under Pharmacoinformatics, Introduction to contour plots.	30	50
2	**Patents:** Definition, Need for patenting, Types of Patents, Condition to be satisfied by an invention to be patentable, Introduction to patent search, The essential elements of patents, Guidelines for preparations of laboratory notebook, non-obviousness in patents, Drafting of patent claims, important patent related websites.	15	25
3	**Brief introduction to trademark protection and WO patents:** Introduction to "The Patents Act 1970" and "The Patents Rule 2003", with special emphasis on the forms to be submitted along with a patent application.	15	25

List of References:

Reference Books:

1. Lewis G.A., Mathiea D., Roger Phan-Tan-Luu, Pharmaceutical Experimental Design, Marcel Dekker Inc.

2. Armstrong N.A, James L.K.C., Pharmaceutical Experimental Design and Interpretation by Taylor & Francis.
3. Anderson, M, DOE simplified, CRC Press
4. Anderson, M, RSM simplified, CRC Press
5. Box GEP, Hunter WG, and Hunter, Statistics for Experimenters, Wiley, 1978
6. Cochran WG and Cox GM, Experimental Designs, Wiley by 1957
7. Fisher RA, The Design of Experiments, 8th edition, Hafner, 1966
8. Pukelsheim F, Optimal Design of Experiments, Wiley, 1993
9. Winer BJ, Statistical Principles in Experimental Design, 2nd ed., McGraw-Hill, 1962
10. Current Patent Acts of Various countries.

Text books:

1. IPR Handbook for Pharma Students and Researcher, Parikshit Bansal, Pharma Book Syndicate.

E-resources:

1. http://www.itl.nist.gov/div898/handbook/pri/section1/pri11.htm
2. http://stattrek.com/experiments/experimental-design.aspx?Tutorial=AP
3. http://www.stat.yale.edu/Courses/1997-98/101/expdes.htm
4. http://indiainbusiness.nic.in/newdesign/index.php?param=investment_landing/267/3
5. http://www.wipo.int/edocs/pubdocs/en/intproperty/450/wipo_pub_450.pdf
6. http://onlinelibrary.wiley.com/doi/10.1002/cem.930/pdf