Uka Tarsadia University

Announce an exclusive

One Week FDP Course in

BIOSTATISTICS AND EXPERIMENTAL DESIGNS: THEORY AND HANDS ON APPLICATIONS

Course Commencement Dates: 25th April 2016

25th April to 29th April 2016

Venue: IBM Lab, Maliba Pharmacy College, UTU, Maliba Campus, Bardoli

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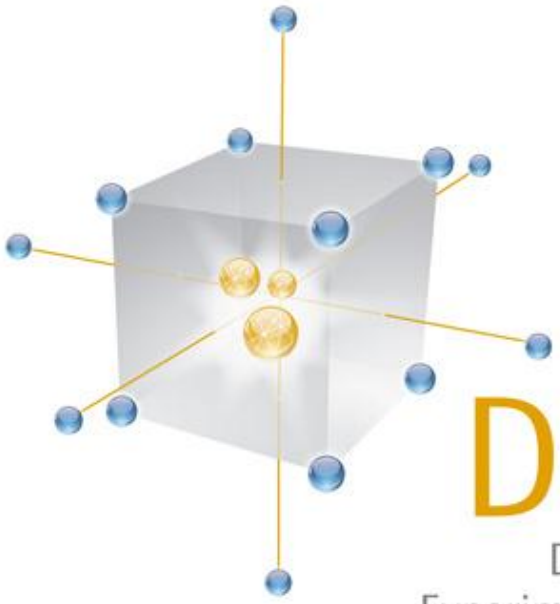

DoE
Design of Experiments

We are pleased to announce acceptance of nominations for the following course as the per the details given

Name of the course	**EXPERIMENTAL DESIGNS- THEORY AND HANDS ON APPLICATIONS**
Duration and starting date	05 days residential Beginning Monday, 25th April, 2016. Course dates are subject to final confirmation.
Venue	**UTU, Maliba Campus, Bardoli**
Eligibility	UTU faculty members engaged in guiding students for research work as a part of dissertation who need a fundamental understanding of the DOE (Design of Experiment) related to products and processes. Research scholars of UTU
Last Date for Nominations	**24th April , 2016**
No of participants accepted	**30, First come first serve basis**

1. Course back ground:

This three-days workshop will develop the knowledge and skills necessary to design, conduct and analyse industrial experiments. Basic principles of experimental design and their applications to chemical synthesis, analytical method, formulation development, quality and productivity improvement projects will be presented.

Design of Experiments (DOE) is a methodology that can be effective for general problem solving, improving or optimizing product design and manufacturing processes. Specific applications of DOE include identifying proper design dimensions and tolerances, achieving robust designs, generating predictive math models that describe physical system behaviour, and determining ideal manufacturing settings.

Design of experiments (DoE) is an experimental approach that allows for efficient, simultaneous evaluation of multiple factors. The subsequent statistical analysis of the resulting data provides information on the relationship between the tested factors and various output parameters. The concept of DoE was first described by Sir Ronald Fisher in 1935 while working at an agricultural research facility in England. Since then, many industries, including the pharmaceutical industry, have utilized DoE to improve processes and reduce experimental error. A main advantage of DoE is the ability to understand potential interactions between factors that would not be apparent in a classic one-factor-at-a-time(OFAT) experiment. The goal of the course is to provide participants with the opportunity to learn about various applications of DOE

2. Course objectives:

- To learn Basic statistics for experimental design with – simple and lucid explanation
- Learn how to apply statistical methods and the principles of experimental design to pharmaceutical problems of practical interest, with emphasis on applications. (Cases involving fluidized-bed coating, tablet compression, microsphere, ocular gel forming solutions and much more).
- Learn how to use statistical software packages and spread sheets for statistical analysis.
- Learn how to use Design Expert/SPSS/ms-office software for statistical analysis.
- To explore the use of designs for the screening and characterization of products or processes
- To conceive and conduct a designed experiment to characterize a process and/or product
- To become skilled at the analysis of two-factor designs and response surface designs

3. **Course delivery methodology:**

The workshop will be conducted through a combination of lectures, discussions, hand on training on computers and case studies.

4. **Eligibility- who can apply:**

UTU faculty members engaged in guiding students for research work as a part of dissertation who need a fundamental understanding of the DOE (Design of Experiment) related to products and processes. Research scholars can also nominate for the course.

5. **Registration, Cancellation Rules:**

All interested candidates are expected to fill in the registration form enclosed with suitable endorsements of Departmental Head and forward to Program Coordinator on or before 24TH April 2016.

6. **Faculty:**

Course will be taught by internal faculty.

7. **Course Grading and certification:**

All the registered participants will be evaluated through written tests, case studies as well as practicals and those who are qualified will be certified.

8. **Evaluation process:**

Multiple levels of evaluation will be implemented to assess the assimilation and application of the concepts of the participants. Summary of the evaluation metrics is given below.

Grading			
Item	**Description**	**Marks**	**Test Duration in Hrs.**
1	Case Studies	50	1-4 Hrs.
2	Quiz	50	
3	Total marks	100	
Certifying criteria: ≥70 marks			

9. **Overall Course benefits**:

On completion of the course the participants will have confidence to implement on the leanings at work environment on the following:

a. QbD initiatives with emphasis on Experimental designs
b. Demonstrate the ability to think critically and effectively by utilizing the concept of statistical probability and experimental design.
c. Demonstrate ability to integrate knowledge and idea in a coherent and meaningful manner especially to measures of quality of estimators. In particular, they should be able to use various experimental design techniques.
d. Locate and use information to set up statistically, choose a suitable method, and perform statistical analysis.
e. Describe basic theory of set up and design an experiment and draw conclusion

10. Attendance:

Attendance is compulsory for all the 9 (nine) modules. All courses are structured and delivered with academic rigour and application orientation. All participants are expected to participate in the learning process with involvement to get the right benefits of the learning process.

11. Course coordinator and additional information:

The course will be coordinated by Dr. Ketan Ranch & Dr. Bhavin Vyas. All information relating to the course can be obtained by contacting them. (99254 75599, 98796 29765)

12. Course registration:

Please fill in the course registration google doc form attached. Acceptance to the course is subject to the discretion of the Program coordinators.

13. Course certification:

All successful participants who have scored more than 70% will be issued appropriate certificate.

14. Course coverage summary:

The course timings would be 10:00 am to to 4:00 pm. The course is divided into nine modules and will be delivered with adequate hands on experiments intertwined with theory. Details are given in the following pages. Outline given is subject to change at the discretion of the Program Coordinator based on academic needs and learning needs of participants.

15. References:

1. Mark J. Anderson and Patrick J. Whitcomb, DOE Simplified (Productivity, Inc. 2000). ISBN 1-56327-225-3.
2. George E. P. Box, William G. Hunter and J. Stuart Hunter, Statistics for Experimenters - An Introduction to Design, Data Analysis, and Model Building (John Wiley and Sons, Inc. 1978). ISBN 0-471-09315-7
3. Douglas C. Montgomery, Design and Analysis of Experiments (John Wiley & Sons, Inc., 1984) ISBN 0-471-86812-4.

16. Course Content:

Module No.	Title	Topics	Day
1	Introduction to Biostatistics	• Statistical thinking, Descriptive statistics • Case studies using ms-excel	Day 1
2	Statistical concepts	• Sampling distribution, Central limit theorem • Z-score and Probability • Introduction to hypothesis testing	
3	Hypothesis testing – Parametric test	• Getting started with SPSS • Selection of specific test for hypothesis testing : Normality test, one sample t-test, two independent sample t-test, paired t-test, one way ANOVA, post hoc test, Chi-square test. Practice Session	Day 2
4	Correlation and regression	• Correlation and regression: Simple correlation, partial correlation, simple linear regression, assumptions of regression analysis. Practice Session	
5	Getting started DOE	• Strategies for experimentation; guide to good experimental design; Concepts of randomization, replication, and blocking • Simple comparative experiments: Interaction of factors; factorial vs. OFAT designs; developing prediction equations	Day 3
6	Screening Designs	• Screening • Factorial Design designs	
7	Introduction to Factorial Design (2 hours)	• Factorial design planning procedure Basics of factorial design with case study: Analysis	Day 4

		Plots -- Normal and Half-Normal Plots; Main Effect and Interaction Plots	
8	Complex Design of Experiments	• Response surface methodology (RSM): adding a 3rd level for 2nd order modelling; • Central composite design (CCD) and Box-Benhken design (BBD); multiple response optimization • Finding optimum factor value	
9	Group discussion, case studies	• Case studies, Evaluation and Feed Back	Day 5