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PHOENIX TS

Design and Analysis of Experiments

BONUS! Cyber Phoenix Subscription Included: All Phoenix TS students receive complimentary ninety (90) day access to the Cyber Phoenix learning platform, which hosts hundreds of expert asynchronous training courses in Cybersecurity, IT, Soft Skills, and Management and more!

Course Overview

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- Module 1: Principles and Techniques
  - Design
  - Analysis
- Module 2: Planning Experiments
  - A checklist for planning experiments
  - A real experiment
  - Some standard experimental designs
- Module 3: Designs with One Source of Variation
  - Randomization
  - Model for a completely randomized design
  - Estimation of parameters
  - One-way analysis of variance
  - Sample sizes

- Using SAS software
- Using R software

- Module 4: Inferences for Contrasts and Treatment Means
  - Contrasts
  - Individual contrasts and treatment means
  - Methods of multiple comparisons
  - Sample sizes
  - Using SAS software
  - Using R software
- Module 5: Checking Model Assumptions
  - Strategy for Checking Model Assumptions
  - Checking the fit of the model
  - Checking for Outliers
  - Checking Independence of the error terms
  - Checking the equal variance assumption
  - Checking the normality assumption
  - Using SAS software
  - Using R software
- Module 6: Experiments with Two Crossed Treatment Factors
  - Models and factorial effects
  - Contrasts
  - Analysis of the two-way complete model
  - Analysis of the two-way main-effects model
  - Calculating sample sizes
  - Small experiments

- Using SAS software
- Using R software

- Module 7: Several Crossed Treatment Factors
  - Models and factorial effects
  - Analysis—Equal sample sizes
  - One observation per cell
  - Using SAS software
  - Using R software
- Module 8: Polynomial Regression
  - Models
  - Least squares estimation
  - Test for lack of fit
  - Analysis of the simple linear regression model
  - Analysis of polynomial regression models
  - Orthogonal polynomials and trend contrasts
  - Using SAS software
  - Using R software
- Module 9: Analysis of Covariance
  - Models
  - Least squares estimates
  - Analysis of covariance
  - Treatment contrasts and confidence intervals
  - Using SAS software
  - Using R software
- Module 10: Complete Block Designs

- Blocks, noise factors or covariates?
- Design issues
- Analysis or randomized complete block designs
- Analysis of general complete block designs
- Checking model assumptions
- Factorial experiments
- Using SAS software
- Using R software

· Module 11: Incomplete Block Designs

- Design issues
- Some special incomplete block designs
- Analysis of general incomplete block designs
- Factorial experiments
- Using SAS software
- Using R software

· Module 12: Designs with Two Blocking Factors

- Design issues
- Analysis of Row-Column designs
- Analysis of Latin Square Designs
- Analysis of Youden Designs
- Checking the assumptions on the model
- Factorial experiments in row-column designs
- Using SAS software
- Using R software

· Module 13: Confounded Two-Level Factorial Experiment

- Single replicate factorial experiments
- Confounding using contrasts
- Confounding using equations
- Plans for confounded 2p experiments
- Multireplicate designs
- Complete confounding: Repeated single-R designs
- Partial confounding
- Comparing the multireplicate designs
- Using SAS software
- Using R software

· Module 14: Confounding in General Factorial Experiments

- Confounding with Factors at Three Levels
- Designing using pseudofactors
- Designing confounded asymmetric experiments
- Using SAS software
- Using R software

· Module 15: Fractional Factorial Experiments

- Fractions from block designs
- Blocked Fractional factorial experiments
- Fractions from orthogonal arrays
- Design for the control of noise variability
- Small screening designs: orthogonal main effect plans
- Using SAS software
- Using R software

· Module 17: Random Effects and Variance Components

- One random effect
- Sample sizes for an experiment with one random effect
- Checking assumptions on the model
- Two or more random effects
- Mixed models
- Rules for analysis or random-effects and mixed models
- Block designs and random block effects
- Using SAS software
- Using R software

· Module 18: Nested Models

- Examples and models
- Analysis of nested fixed effects
- Analysis of nested random effects
- Using SAS software
- Using R software

· Module 19: Split-Plot Designs

- Designs and models
- Analysis of a split-plot design with complete blocks
- Split-split-plot designs
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Schedule

Currently, there are no public classes scheduled. Please contact a Phoenix TS Training Consultant to discuss hosting a private class at 301-258-8200.

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    - Analysis of a split-plot design with complete blocks
    - Split-split-plot designs
    - Split-plot confounding
    - Using SAS software
    - Using R software
- Module 20: Computer Experiments
    - Models for computer experiments
    - Gaussian Stochastic Process Model
    - Using SAS software
    - Using R software

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Included in this **Design and Analysis of Experiments**

- 4 days instructor-led training

- Design and Analysis of Experiments training book
- Notepad, pen and highlighter
- Variety of bagels, fruits, doughnuts and cereal available at the start of class*
- Tea, coffee and soda available throughout the day*
- Freshly baked cookies every afternoon*