

# **SEVENTH U.S. ARMY CONFERENCE ON APPLIED STATISTICS**

## **SHORT COURSE**

### **Applied Logistic Regression**

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**Abstract:** This two-day short course will present an introduction to using the logistic regression model. Topics to be covered will include model formulation, parameter estimation, estimation and interpretation of odds-ratios and probabilities, model building strategies, assessment of goodness-of-fit, and presentation and interpretation of results. The course will consider the logistic regression model for binary, multinomial, and ordinal scaled outcomes.

The course will be taught by Professor David W. Hosmer of the Biostatistics Department of the University of Massachusetts. Prof. Hosmer has over 10 years experience teaching similar short courses to statisticians, epidemiologists, physicians and other subject matter scientists.

The course will be based upon selected chapters and sections in Professor Hosmer's recent text, *Applied Logistic Regression*. Co-authored by Professor Stanley Lemeshow of Ohio State University, the second edition of this widely referenced text was published in 2000 by John Wiley & Sons. Topics to be covered from this edition, with sections and page numbers noted, appear below:

#### **1 Introduction to the Logistic Regression Model**

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- 1.2 Fitting the Logistic Regression Model, 7
- 1.3 Testing for the Significance of the Coefficients, 11
- 1.4 Confidence Interval Estimation, 17
- 1.5 Other Methods of Estimation, 21

#### **2 Multiple Logistic Regression**

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- 3.7 Estimation of Odds Ratios in the Presence of Interaction, 74

### **4 Model-Building Strategies and Methods for Logistic Regression**

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- 4.5 Numerical Problems, 135

### **5 Assessing the Fit of the Model**

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  - 5.2.1 Pearson Chi-Square Statistic and Deviance, 145
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- 5.5 Interpretation and Presentation of Results from a Fitted Logistic Regression Model, 188

### **8 Special Topics**

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  - 8.1.2 Interpreting and Assessing the Significance of the Estimated Coefficients, 264
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  - 8.2.1 Introduction to the Models, Methods for Fitting and Interpretation of Model Parameters, 288
  - 8.2.2 Model Building Strategies for Ordinal Logistic Regression Models, 305