

## Regression Modeling Strategies Short Course 2025

### Regression Modeling Strategies

Strategies for good statistical practice, developing accurate predictive models that validate, choosing between statistical models and machine learning, introduction to Bayesian regression modeling, and complete R examples.

[Time/hours are Central Standard Time (CST)]

#### 1<sup>ST</sup> DAY – Thursday, May 15

9:00 – 10:00      Introduction

- i.    Philosophy of Multivariable Modeling
- ii.   Model uncertainty / Data-driven Model Specification [chapter 1.6]

10:15 – 12:00      General Aspects of Fitting Regression Models [chapter 2]

12:45 – 2:00      continue, General Aspects of Fitting Regression Models [chapter 2]

2:30 – 4:00      i. Multivariable Modeling Strategies [chapter 4]

#### 2<sup>ND</sup> DAY – Friday, May 16

9:00 – 10:15      i. Describing model fits and model validation [chapter 5]

10:30 – 12:00      i. Binary Logistic Regression [chapter 10]

ii. Logistic Model Case Study: Survival of Titanic Passengers [chapter 12]

12:45 – 2:00      i. Ordinal Logistic Regression [chapter 13]

ii. Ordinal Regression Examples [chapter 13, BBR 7.6, 7.8, 7.9 (paired data)]

2:15 – 4:00      i. Modeling Longitudinal Responses using Generalized Least Squares [chapter 7]

ii. Regression Models for Continuous Y and Case Study in Ordinal Regression [chapter 15]

### 3<sup>RD</sup> DAY – Monday, May 19

- |               |  |
|---------------|--|
| 9:00 – 10:45  | continue, Regression Models for Continuous Y and Case Study in Ordinal Regression [chapter 15] |
| 11:00 – 12:00 | Semiparametric Ordinal Longitudinal Models [chapter 22]  |
| 12:45 – 1:45  | Causal Models for Variable Selection   |
| 1:45 – 2:30   | i. Advantages of Bayesian modeling   |
|               | ii. Constraining regression models using Bayesian priors                                       |
| 2:30 – 4:00   | i. Parametric Survival Models [chapter 18]   |
|               | ii. Case Study in Parametric Survival Modeling and Model Approximation [chapter 19]            |

### 4<sup>TH</sup> DAY – Tuesday, May 20

- |               |  |
|---------------|--|
| 9:00 – 10:15  | i. Cox Proportional Hazards Regression Model [chapter 20]                      |
|               | ii. Case Study in Cox Regression [chapter 21]                                  |
| 10:30 – 12:00 | Ordinal Semiparametric Regression for Survival Analysis [chapter 25]           |
| 12:45 – 2:00  | continue, Ordinal Semiparametric Regression for Survival Analysis [chapter 25] |
| 2:15 – 3:00   | General likelihood ratio test and profile confidence limits                    |
| 3:00 – 4:00:  | Summary and discussion   |