

# **Spring 2025 Short Course:**

#### **Introduction to Biostatistics**

### Presented by Youngju Pak, PhD.

#### Hybrid Sessions

## Location: MRL Boardroom, Rm.103

with ZOOM provided by Lundquist Institute

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Registration Link: https://redcap.link/h2nexlfn



Date	Topic to covered
Session 1 Apr 1 (Tuesday) 3:30 pm– 5:00pm	<ul> <li>Understanding Statistical Inferences</li> <li>Distinguishing Descriptive Statistics from Inferential Statistics</li> <li>The Significance of Sampling Distribution</li> <li>Distinguishing Standard Deviation from Standard Errors</li> <li>Understanding P-values in Hypothesis Testing</li> <li>Interpreting Confidence Intervals</li> </ul>
Session 2 Apr. 8 (Tuesday) 3:30 pm– 5:00pm	<ul> <li>Sample Size Justification with Statistical Power.</li> <li>Why Power Analysis Matters</li> <li>Type I (α) and Type II (β) errors</li> <li>Statistical power (1 - β) and its implications</li> <li>Computing Statistical power with G*power</li> <li>Common Pitfalls &amp; Best Practices</li> </ul>
Session 3 Apr. 15 (Tuesday) 3:30 pm– 5:00pm	<ul> <li>Analysis of Variance (ANOVA) &amp; Analysis of Covariance (ANCOVA).</li> <li>When to Use ANOVA vs. ANCOVA</li> </ul>

	<ul> <li>Key Assumptions &amp; Model Validation</li> <li>Interpreting Results: F-Tests, P-Values, and Effect Sizes</li> <li>Multiple Comparisons &amp; Error Control</li> <li>Application with SPSS (statistical software)</li> </ul>
Session 4 Apr 23 (Tuesday) 3:30 pm– 5:00pm	<ul> <li>Analyzing Repeated Measures &amp; Interpretation of Results.</li> <li>Introduction to Repeated Measures ANOVA</li> <li>Repeated Measures ANOVA vs. Mixed Models</li> <li>Key Assumptions &amp; Sphericity Considerations</li> <li>Interpreting ANOVA Tables &amp; Multiple Comparisons</li> <li>Goodness of Fit &amp; Model Validation</li> <li>Application with SPSS (statistical software)</li> </ul>
Session 5 Apr.29 (Tuesday) 3:30 pm– 5:00pm	<ul> <li>Correlations &amp; Linear Regression Models.</li> <li>Pearson &amp; Spearman Correlation: Interpretation &amp; Limitations</li> <li>Simple vs. Multiple Linear Regression (SLR vs. MLR)</li> <li>Key Assumptions &amp; Model Diagnostics</li> <li>Interpreting R-Squared &amp; Model Fit Statistics</li> <li>Collinearity &amp; Variable Selection in MLR</li> <li>Application with SPSS (statistical software)</li> </ul>
Session 6 May 6 (Tuesday) 3:30 pm– 5:00pm	<ul> <li>Diagnostic tests &amp; Logistic Regression Models.</li> <li>Understanding Diagnostic Test Performance</li> <li>Sensitivity, Specificity, and Predictive Values</li> <li>Odds Ratios (OR) &amp; Relative Risks (RR)</li> <li>Introduction to Logistic Regression</li> <li>Interpreting Regression Coefficients &amp; Odds Ratios</li> <li>ROC Curves &amp; Area Under the Curve (AUC)</li> <li>Sample Size Considerations in Logistic Regression</li> <li>Application with SPSS (statistical software)</li> </ul>