Fox Module 11 Statistical inference for simple linear regression

- Properties of least squares estimators
- Confidence intervals
- Hypothesis testing

Read Section 6.1.1, “Simple regression model,” on page 100-102. Understand each of the bullet points on these pages; they are tested on the final exam.

Read Section 6.1.2, “Properties of least squares estimators,” on pages 102-104. Focus on bias and efficiency of linear estimators.

Know equation 6.1 on page 103. It is used for confidence intervals and t-tests, and it is tested on the final exam.

Read Section 6.1.3, “Confidence intervals and hypothesis tests,” on pages 104-105. Know the formulas on page 104 and the example on page 105. The final exam tests this subject various ways. Exam problems ask for

- standard errors and variances of the estimators for α and β
- *t*-values for α and β
- confidence intervals for α and β

The *t*-value depends on the null hypothesis (the β_0 in the equation on page 104). The width of the confidence interval does not depend on the null hypothesis.

This module is critical for classical regression analysis and is heavily tested on the final exam. Know how to form standard errors of estimators, *t*-values, and confidence intervals by pencil and paper. The practice problems show all the variations on the final exam.

The final exam gives the critical *t* values for various confidence intervals. For your student project, you can find these critical values and associated *p* values from Excel.