

Syllabus for Statistics-Forestry-Horticulture 572

Linear Regression (about 11 lectures)

- Review of simple linear regression
- Residual analysis—which plots to make, what to look for, tests for outliers, corrective action
- Transformations
- Weighted least squares
- Pure error versus model error
- Relationship between regression and ANOVA models
- Multiple regression—order of fitting, testing reduced models
- Polynomial regression
- Multicollinearity
- Stepwise fitting procedures
- Autocorrelation
- Comparing regression lines

Experimental Design and Analysis of Variance (about 16 lectures)

- Definitions of experimental unit and experimental error
- Role of blocking
- Importance of randomization
- One-way completely randomized design—how to implement, model, power, assumptions, diagnostics (residuals)
- More on contrasts—orthogonal contrasts, orthogonal polynomials
- Use of regression ideas (analysis of covariance)
- One-way random effects model—inference on variance components, inference about the mean
- Subsampling—role in experimentation, allocation of resources
- Randomized complete block design—how to implement, when to use, model, limitations, subsampling
- Latin square design—how to implement, when to use, model, designs with several squares
- Multi-factor designs (fixed effects)—meaning of interaction, role of blocking within these designs, models
- Multi-way random effects and mixed models
- Split-plot design
- Repeated measures—basic issues, useful approaches

Selected additional topics (as time permits)