

## Descriptive Statistics and Basic Concepts (about 2 lectures)

- Graphical and tabular displays
- Summary statistics
- Motivation of some main ideas in statistical inference
- The role of exploratory analysis
- Population and sample

## Distributional models and probability (about 5 lectures)

- Elementary probability
- Elementary properties of random variables
- The meaning of a distributional model
- Binomial distribution
- Normal distribution
- Central limit theorem
- Normal approximation to the binomial
- Sampling distributions for sample mean and sample variance

## One-sample normal inference (about 6 lectures)

- The logic underlying testing
- Testing for mean and variance
- Confidence intervals for the mean and variance
- Inference for proportions
- Power and determination of sample size
- Underlying assumptions, including detection, corrective action, and robustness

## Two-sample inference (about 4 lectures)

- Design aspects
- Inference for means with paired samples
- Inference for means with independent samples
- Inference for proportions
- Inference for variances
- Underlying assumptions
- Nonparametric approaches

## One-way Analysis of Variance (about 4 lectures)

- Basic ideas and procedures
- Fixed effects model and interpretation
- Underlying assumptions
- Contrasts and multiple comparisons

## Simple linear regression and correlation (about 4 lectures)

- Method of least squares
- Models and interpretation
- Inference and prediction for regression
- Underlying assumptions and analysis of residuals
- Correlation

## Goodness-of-fit (about 2 lectures, as time permits)

- Basic ideas
- One and two-way tables

Stat/For/Hort 572 will be a continuation of 571. Primary emphasis will be placed on more advanced regression material, including multiple regression and model fitting, and on experimental design and additional topics in analysis of variance, including multi-way ANOVA, nested models, random effects, and the relationship between regression and analysis of variance. Substantial effort will be devoted to the role of assumptions in all analyses. Assignments will include analysis of data incorporating many of the complexities found in real experimental studies.