Review:

Intro

- Population vs sample, parameter vs estimate, types of variables
- Descriptive statistics vs inferential statistics
- Central limit theorem
- Type I & II errors, statistical power

t-tools

- Z-test, one sample t-test
- Two independent sample t-test
- Paired t-test
- Assumptions for t-tools
- Non-parametric way for paired/independent two-sample comparison
- Statistical significance vs practical significance.
- P-value vs confidence interval

One-way ANOVA:

- Compare several groups: One-way ANOVA model: assumptions, null hypothesis & alternative
- Planned and unplanned comparisons, linear combination of group means, contrast, pairwise comparison
- Extra-sum-of-squares F test: separate mean model vs reduced model

Simple linear regression

- Simple linear regression, assumptions, residuals, confidence interval, prediction interval,
- Extra-sum-of squares: Simple linear regression vs ANOVA=> lack of fit test
- R^2 in simple linear regression model fitting, R^2 vs slope,

Multiple linear regression:

- Multiple linear regression: what does “linear” mean? What does “multiple” means?
- data exploration; Assumptions; inferences about the coefficients
- Extra-sum-of-squares: complicated linear regression or reduced linear regression?

- Interpreting Regression Coefficients
- Specially Constructed Explanatory Variables – Polynomial Regressions/ Dummy variable
- Interaction
- Strategy and approaches for variable selection-

forward/backward/all subsets (cp, aic)

- Case-influence statistics (cook's D/studentized residual/leverage)

Two-way ANOVA

- Additive model
- Nonadditive model - interaction

Repeated measurements

- Univariate vs multivariate approach

Proportions, Odds, and tables of counts

- compare categorical response for two populations: proportions
- why odds?
- Table of counts – tests

Introduction to the Generalized Linear Model

- Link function, distribution

Logistic regression for binary & binomial responses:

- binomial distribution
- Interpretation of odds
- Test for coefficients
- Model assessment for fitting binomial count data.

Read JMP output

Conceptual questions from each chapter