Sample versus population
- Regression notation (with and without matrices)
- Conceptual

Uses of regression equation
- Prediction
- Estimation
- Relationships

Cause and effect relationship – when you can conclude one exists

Reading R output for various tests, including SSR(set of X | set of X), confidence intervals, prediction intervals, estimated coefficients, etc.

Interpreting confidence interval for $E\{Y_h\}$; prediction interval for $Y_{h(new)}$

Meaning of R^2 and use of R^2 and R^2-adjusted

Different ways to test things
- t-test for one variable (test that the variable's coefficient $\beta = 0$)
- F test for one or multiple variables (multiple β's $= 0$)
- Full versus reduced model tests

Assumptions, checking conditions (plots), making corrections through transformations, transforming back to original units

Indicator variables – how to use them to create different intercepts and/or different slopes, and to test for those; setting up the X matrix

Interpretation of all regression coefficients, whether indicator variables are used or not, including interactions

Variable selection
- Criteria such as Mallow's Cp
- Difference between all subsets and stepwise

Case diagnostics – how to use them to find unusual cases (different measures like t_i, h_{ii}, etc.), and what to do about them