- Multivariate statistics
    - Correlation, covariance matrix
    - Multivariate normal distribution
    - Matrix algebra
- Bias-variance decomposition
- Training and test error
- Cross-validation
- Model selection
- Overfitting
- (Gaussian) Multiple linear regression
    - Loss function, gradient, normal equations
    - t-test, F-test, confidence intervals, RSS
    - Ridge or L2 regularization
    - Colinearity between predictors
    - Categorical variables
- Bayes classifier
    - Analytical expression given pdf of classes
    - Classifier boundary
- Linear classifiers -- generative and discriminative
    - Logistic regression, kNN, LDA, QDA, Naive Bayes
    - How do these classifiers compare vs each other?
- Principal component analysis
    - SVD, re-center and/or scaling data matrix
    - Eigenvectors, eigenvalues -- how to calculate them in `R`
    - Principal components regression
- Basics of network analysis
    - Adjacency matrix -- how to build a graph in `R`
    - Eigenvector centrality
    - PageRank
    - Edge betweenness
- Measures and metrics in networks
    - Laplacian matrix for graph embedding
    - Modularity -- definition, how to calculate
    - Node similarity with cosine and Jaccard coefficient
- Community detection

- Hierarchical methods (agglomerative and divisive)
- Spectral method based on modularity matrix