

Statistical Data Analysis

1. **Course Code** : BLM3590
2. **Course Name** : Statistical Data Analysis
3. **Instructor** : Nizamettin AYDIN
4. **Credit** : 3
5. **Nature of the course** : Lecture
6. **Assesments** :
 - Quiz : 10%
 - Midterm 1 : 25%
 - Homeworks : 20%
 - Attendance & participation : 05%
 - Final : 40%
7. **Course Outline** :
 - Introduction
 - Why we use statistics?
 - Overview of statistical inference
 - Exploring Data
 - Data Import and Export
 - Summarizing Data with Descriptive Statistics (mean, median, variance, ...)
 - Plotting Data (histogram, scatter plot, boxplot, ...)
 - Estimation
 - Estimating Population Mean and Variance
 - Confidence Interval
 - Hypothesis Testing
 - Statistical Significance
 - Hypothesis Testing Using t-tests
 - Statistical Inference
 - One Sample t-test
 - Two Sample t-test
 - Paired Sample t-test
 - Analysis of Variance (ANOVA)
 - The Assumptions of ANOVA
 - Two-way ANOVA
 - Analysis of Categorical Variables
 - Pearson's χ^2 Test for One Categorical Variable
 - Pearson's χ^2 Test of Independence
 - Linear Regression
 - Predictive models
 - Simple Regression Models
 - Multiple Regression Models
 - Inference in Regression Models
 - Clustering
 - K-means Clustering
 - Hierarchical Clustering
 - Bayesian Analysis (If we have time)
 - Prior Belief
 - Posterior Distribution
 - Some Simple Bayesian Models
 - Bayesian Inference
 - A Statistical Tool: R Programming
 - Installing and starting with R
 - Objects, Vectors, Matrices
 - Data Frames, Lists
 - Conditional Statement and Loops

– Creating Functions

8. Recommended Texts

:

[Biostatistics with R, An Introduction to Statistics Through Biological Data](#) , Babak Shahbaba, 2012.

An Introduction to Statistical Methods and Data Analysis, R. Lyman Ott, Micheal Longnecker

9. Course Materials

: <http://www.yildiz.edu.tr/~naydin>