**Introduction to Probability and Statistics**

**BMI 6106**

**Course Schedule**

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| Week | Day | Topic | Chapter/Book | Homework | Project Timeline |
| Monday | Jan 10 | Course Introduction |  |  | Project Introduction |
| Wednesday | Jan 12 | Setting up R environment  Introduction to R | Install R, Rstudio, check github |  | Literature Review |
| Monday | Jan 17 | MLK Day holiday |  |  |  |
| Wednesday | Jan 19 | Probability Introduction:  Rules of probability | Introduction to Probability and Statistics Using R  Kerns. Chapter 4 Probability |  | Literature Review |
| Monday | Jan 24 | Probability Review  Bayes Rule  Markov Chains |  |  |  |
| Wednesday | Jan 26 | Markov Chains | Introduction to Probability and Statistics Using R  Kerns. Chapter 4 Probability |  | Literature Review |
| Monday | Jan 31 | Probability distributions,  PDF, CDF,  Maximum Likelihood Estimators | Introduction to Bayesian statistics  William M. Bolstad , and James M. Curran  Chapter 5 -7 | HW 1 Due | Find Datasets |
| Wednesday | Feb 2 | Resampling methods  Risk/Odds Ratio  Naïve bayes, | Resampling Methods, chapter 2  An introduction to Statistical learning chapter 5 |  | Write proposal |
| Monday | Feb 7 | Bayesian Networks |  | HW 2 Due | Write proposal |
| Wednesday | Feb 9 | Bayesian Networks |  |  | Write proposal |
| Monday | Feb 14 | Estimation I, Data Visualization | Zuur 2010. | Exam I | Project Proposal due |
| Wednesday | Feb 16 | Data Visualization |  |  | Data Analysis/ Find Datasets |
| Monday | Feb 21 | Presidents Day holiday |  | Exam I Due | Data Analysis/ Find Datasets |
| Wednesday | Feb 23 | Hypothesis Testing,  t-test, ANOVA | An introduction to Statistical learning chapter 3 |  | Data Analysis/ Find Datasets |
| Monday | Feb 28 | Linear Regression I,  Correlation,  Logistic Regression | An introduction to Statistical learning chapter 5 | HW 3 Due | Data Analysis/ Find Datasets |
|  |  | Linear Regression II  Regularization Methods  Cross-validation |  |  | Data Analysis/ Find Datasets |
| Monday | Mar 7 | Spring Break |  |  |  |
| Wednesday | Mar 9 | Spring Break |  |  |  |
| Monday | Mar 14 | Linear Regression III  Regularization Methods  Non-parametric testing | Fundamentals of Biostatistics Chapter 9 | HW 4 Due | Write Analysis |
| 10 (Wednesday) | Mar 16 | Discrete inference and contingency tables (fisher exact, chi square test) |  |  | Write Analysis |
| Monday | Mar 21 | Clustering Methods, PCA |  | HW 5 Due  Exam II | Write Analysis |
| Wednesday | Mar 23 | Clustering Methods, k-means – Hierarchical clustering |  |  | Write Analysis |
| Monday | Mar 28 | Survival Analysis |  | Exam II Due | Write Final Document |
| Wednesday | Mar 30 | Time series |  |  | Analysis Document Due |
| Monday | April 4 | Information Theory;  Entropy,  Information Gain |  | HW 6 Due | Write Final Document |
| Wednesday | April 6 | Generalized linear models (mixed models) |  |  | Write Final Document |
| Monday | April 11 | Entropy Project Class Project |  | Exam 3 | Write Final Document |
| Wednesday | April 13 | Entropy Project Class Project |  |  | Write Final Document |
| Monday | April 18 | Entropy Project Presentations |  |  | Write Final Document |
| Wednesday | April 20 | Final Project Presentations |  |  | Final Project Document Due |
| Monday | April 25 |  |  | Exam 3 Due |  |