**Introduction to Probability and Statistics**

**BMI 6106**

**Course Schedule**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Week | Day | Topic | Chapter/Book | Homework | Project Timeline |
| 1 (Monday) | Jan 6 | Course Introduction  Setting up R environment  Introduction to R | Complete an online course R (e.g. programming with R - coursera) |  | Project Introduction |
| 1 (Wednesday) | Jan 8 | Probability Review  Bayes Rule  Markov Chains | Introduction to Probability and Statistics Using R  Kerns. Chapter 4 Probability |  | Literature Review |
| 1 (Wednesday) | Jan 22 | Markov Chains | Introduction to Probability and Statistics Using R  Kerns. Chapter 4 Probability |  | Literature Review |
| 2 (Monday) | Jan 27 | Probability distributions,  PDF, CDF,  Maximum Likelihood Estimators | Introduction to Bayesian statistics  William M. Bolstad , and James M. Curran  Chapter 5 -7 |  | Find Datasets |
| 2 (Wednesday) | Jan 29 | Bayesian Inference,  Naïve bayes, |  | HW 1 Due | Write proposal |
| 3 (Monday) | Feb 3 | Distributions  Introduction to Bayesian Analysis |  |  | Write proposal |
| 1 (Wednesday) | Feb 5 | Naïve bayes,  Resampling methods  Risk/Odds Ratio |  | HW 2 |  |
| 1 (Monday) | Feb 10 | Naïve bayes,  Resampling methods  Risk/Odds Ratio | Resampling Methods, chapter 2  An introduction to Statistical learning chapter 5 |  | Project Proposal due |
| 1 (Wednesday) | Feb 12 | Estimation I, Data Visualization |  | HW 3 | Data Analysis/ Find Datasets |
| 1 (Monday) | Feb 17 | Data Visualization | Zuur 2010. | Andrew | Data Analysis/ Find Datasets |
| 1 (Wednesday) | Feb 19 | Hypothesis Testing,  t-test, ANOVA |  | Exam I | Data Analysis/ Find Datasets |
| 1 (Monday) | Feb 24 | President’s Day | An introduction to Statistical learning chapter 3 |  | Data Analysis/ Find Datasets |
| 1 (Wednesday) | Feb 26 | Linear Regression I,  Correlation,  Logistic Regression |  | HW 4 – Gordon Lemmon | Data Analysis/ Find Datasets |
| 1 (Monday) | March 2 | Hypothesis Testing, Linear Regression | An introduction to Statistical learning chapter 5 |  | Data Analysis/ Find Datasets |
| 1 (Wednesday) | March 4 | Linear Regression II  Regularization Methods  Cross-validation |  | HW 4 | Data Analysis/ Find Datasets |
| 1 (Monday) | March 9 | Spring Break |  |  | Write Analysis |
| 1 (Wednesday) | March 11 | Spring Break | Fundamentals of Biostatistics Chapter 9 |  | Write Analysis |
| 1 (Monday) | March 16 | Regularization Methods  Non-parametric testing |  | HW 5 Regression |  |
| 1 (Wednesday) | March 18 | Bayesian Networks |  |  |  |
| 1 (Monday) | March 23 | Bayesian Networks | The Elements of Statistical Learning Chapter 3,5,and 7 | Exam II | Write Analysis |
| 1 (Wednesday) | March 25 | Clustering Methods, PCA |  | HW 6 BN | Write Analysis |
| 1 (Monday) | March 30 | Clustering Methods, PCA |  |  | Write Analysis |
| 1 (Wednesday) | April 1 | Survival Analysis |  | HW 7 PCA | Write Final Document |
| 1 (Monday) | April 6 | Time series |  |  | Analysis Document Due |
| 1 (Wednesday) | April 8 | Information Theory;  Entropy,  Information Gain |  | Andrew | Write Final Document |
| 1 (Monday) | April 13 | Entropy Project |  | HW 8 Entropy Project | Write Final Document |
| 1 (Wednesday) | April 15 | Entropy Project |  |  |  |
| 1 (Monday) | April 20 | Entropy Project, Final Project Presentations |  | Exam 3 | Final Project Document Due |