**Introduction to Probability and Statistics 2021**

**BMI 6106**

**Course Schedule**

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| Week | Day | Topic | Chapter/Book | Homework | Project Timeline |
| 1 Wednesday | Jan 20 | Course Introduction |  |  | Project Introduction |
| 2 Monday | Jan 25 | Setting up R environment  Introduction to R | Complete an online course R (e.g. programming with R - coursera) |  | Literature Review |
| 2 Wednesday | Jan 27 | Introduction to R |  |  | Literature Review |
| 3 Monday | Feb 1 | Introduction to R | Introduction to Probability and Statistics Using R  Kerns. Chapter 4 Probability |  | Literature Review |
| 3 Wednesday | Feb 3 | Probability Review  Bayes Rule  Markov Chains | Introduction to Probability and Statistics Using R  Kerns. Chapter 4 Probability |  | Literature Review |
| 4 Monday | Feb 8 | Probability Review  Bayes Rule  Markov Chains | Introduction to Bayesian statistics  William M. Bolstad , and James M. Curran  Chapter 5 -7 |  | Find Datasets |
| 4 (Wednesday) | Feb 10 | Probability Review  Bayes Rule  Markov Chains |  |  | Write proposal |
| 5 (Monday) | Feb 15 | MLK |  |  | Write proposal |
| 5 (Wednesday) | Feb 17 | Probability distributions,  PDF, CDF,  Maximum Likelihood Estimators | Introduction to Bayesian statistics  William M. Bolstad , and James M. Curran  Chapter 5 -7 |  | Write proposal |
| 6 (Monday) | Feb 22 | Probability distributions,  PDF, CDF, |  | HomeWork 4 | Project Proposal due |
| 6 (Wednesday) | Feb 24 | Naïve bayes,  Resampling methods  Risk/Odds Ratio | Resampling Methods, chapter 2  An introduction to Statistical learning chapter 5 |  | Data Analysis/ Find Datasets |
| 7 (Monday) | March 1 | Estimation I  Data Visualization | Zuur 2010. | HomeWork 5 | Data Analysis/ Find Datasets |
| 7 (Wednesday) | March 3 | Hypothesis Testing,  t-test, ANOVA |  |  | Data Analysis/ Find Datasets |
| 8 (Monday) | March 8 | Bayesian Networks |  | Exam I | Data Analysis/ Find Datasets |
| 8 (Wednesday) | March 10 | Bayesian Networks |  |  | Data Analysis/ Find Datasets |
| 9 (Monday) | March 15 | Linear Regression I, | An introduction to Statistical learning chapter 5 | HomeWork 6 | Data Analysis/ Find Datasets |
| 9 (Wednesday) | March 17 | Linear Regression II,  Correlation,  Logistic Regression |  |  | Data Analysis/ Find Datasets |
| 10 (Monday) | March 22 | Hypothesis Testing, Linear Regression |  | HomeWork 7 | Analysis Review |
| 10 (Wednesday) | March 24 | Regularization Methods  Cross-validation | Fundamentals of Biostatistics Chapter 9 |  | Write Analysis |
| 11 (Monday) | March 29 | Regularization Methods  Non-parametric testing |  | HomeWork 8 |  |
| 11 (Wednesday) | March 31 | Clustering Methods, PCA |  |  |  |
| 12 (Monday) | April 5 | Clustering Methods, K-means – hierarchical clustering | The Elements of Statistical Learning Chapter 3,5,and 7 | Exam II | Write Analysis |
| 12 (Wednesday) | April 7 | Survival Analysis |  |  | Write Analysis |
| 13 (Monday) | April 12 | Time series |  | HomeWork 9 | Write Analysis |
| 13 (Wednesday) | April 14 | Information Theory;  Entropy,  Information Gain |  |  | Write Final Document |
| 14 (Monday) | April 19 | Maximum Likelihood Estimators  Entropy Project |  |  | Analysis Document Due |
| 14 (Wednesday) | April 21 | Case Studies |  | HomeWork 10 | Write Final Document |
| 15 (Monday) | April 26 | Case Studies |  |  | Write Final Document |
| 15 (Wednesday) | April 28 | Final Project |  | Exam III | Final Project Document Due |
| 16 (Monday) | May 3 | Entropy Project, Final Project Presentations |  | Exam III Due |  |