# Outline for MA223 Notes

1. Language and Logic of Inference
   1. The Statistical Process
      1. Anatomy of a Dataset
      2. A Note on Codebooks
   2. Case Study: Deepwater Horizon
   3. Asking the Right Questions (F1)
      1. Characterizing a Variable
      2. Framing the Question
   4. Gathering the Evidence (Data Collection) (F2)
      1. Goal of Sampling (distribution of population)
      2. Bias
      3. Good Sampling Schemes
      4. Observational vs. Controlled Experiments
   5. Presenting the Evidence (Data Summaries) (F3)
      1. Graphical Summaries (distribution of the sample)
      2. Numerical Summaries
   6. Assessing the Evidence (Variability in the Estimates) (F4)
      1. Sampling Distributions
      2. Null Distributions
   7. Quantifying the Evidence (F5)
      1. Specifying reasonable values
      2. Likelihood of the data
   8. Review of the Language and Logic
2. Comparing the Mean Response for Multiple Groups (ANOVA)
   1. Case Study: Organic Foods and Morals
   2. FI1:
   3. FI2:
   4. FI3:
   5. FI4:
   6. FI5:
3. Classical Approach to ANOVA
4. Modeling the Mean Response as a Function (Regression)
   1. Case Study: Seismic Activity from Greece
   2. FI1:
   3. FI2:
   4. FI3:
   5. FI4:
   6. FI5:
5. Classical Approach to Regression
6. Special Cases
   1. One-Sample Inference (t-test)
   2. Two-Sample Inference (t-test)
   3. Paired Inference (t-test)
7. Mathematical Tools
   1. Essential Probability
   2. Essential Calculus