Tentative Course Outline\textsuperscript{1,2}

\textit{Week \#1}

- Proofs and logical arguments
- Set Theory
  - Functions, relations...
- Analysis
  - Topology of the Real numbers, closed/open sets, convergence, compactness, metric spaces, sequences, continuity. Correspondences, upper hemi-continuity, lower hemi-continuity, fixed point theorems.

\textit{Week \#2}

- Functions of Several Variables
  - Convexity, differentiation, approximation by differentials, Mean value/ Inverse/ Implicit Function theorems.
- Statistics
  - Combinatorial probability, Bayes’ rule, random variables, univariated/multivariated distributions, independence, covariance, correlations, types of convergence, Chebyshev’s inequality, law of large numbers, Central limit theorems.

\textit{Week \#3}

- Linear Algebra
  - Linear mappings and matrices, basis, linear independence, rank, subspaces and dimensions, determinant, eigenvalues, definiteness, conditions of non-singularity, orthogonality and projection matrices.

\textsuperscript{1}These are some bullet points with a subset of the topics to give you some idea about the roadmap of the course. The content and the order of the topics may change before the Math Camp starts.

• Unconstrained Optimization
• Constrained Optimization
  – Lagrange Method
  – Kuhn-Tucker Theorem