1. **Definition of Asset Allocation**

2. **Asset Classes and Stylized facts – Modeling Univariate and Multivariate Assets**

3. **Evaluating Allocations - Utility Functions**
   - 3.1. Investor’s objectives
   - 3.2. Stochastic dominance
   - 3.3. Satisfaction
   - 3.4. Certainty-equivalent (expected utility)
   - 3.5. Quantile (value at risk)
   - 3.6. Coherent indices (expected shortfall / CVaR)

4. **Portfolio Optimization**
   - 4.1. Mean Variance definition
   - 4.2. Analytical Mean Variance
   - 4.3. Numerical Methods
   - 4.4. Impact of Constraints

5. **Correlations and Copulas**
   - 5.1. Simple Correlation Model
   - 5.2. Time Varying Correlation - Dynamic Correlation Models
   - 5.3. Random Matrix Theory and PCA
   - 5.4. Copulas

6. **Estimation techniques and Estimation Risk**
   - 6.1. Estimation methods
   - 6.2. Robust Allocation Methods
   - 6.3. Black Litterman, Bayesian Methods and COP approach

7. **Factor Models**
   - 7.1. Linear factor Models
   - 7.2. PCA
   - 7.3. Nested factor models

8. **Diversification Measures and Factor Diversification**

9. **Mean Conditional Value at Risk for non-Elliptical Distributions**
   - 9.1. Copulas in asset allocation – Non-linear correlations
   - 9.2. Nested factor models for non-linear dependence
10. Dynamic / Active Allocation Strategies
   10.1. Strategic Asset Allocation
   10.2. Tactical Asset Allocation
      10.2.1. Systematic Asset Allocation Strategies
      10.2.2. Discretionary Asset Allocation Strategies
   10.3. Equally Weighted Portfolios
   10.4. Risk Parity Portfolios
   10.5. Principal Portfolios
   10.6. Convex/Concave Strategies
   10.7. CPPI / OBPI / Drawdown Control

11. Liquidity and Market Impact

12. Implementation and performance attribution

Reference Text(s): There are no assigned textbooks for this class. Good references are:


Grading:

- Homework : Bi weekly 20%
- Project : 30%
- Mid Term Test : 15%
- Final Test : 35%