Tentative Syllabus BT4016 (AY22/23 Sem 2)

Risk Analytics for Financial Services

This module (BT4016) exposes students to fundamentals of risk analytics in the financial service sector. Students will learn about: 1] financial risk metrics (volatility, VaR, crash risk, etc.); 2] statistical risk modeling and analytics for stocks, bonds, asset portfolios, and other types of financial derivatives (including options, futures and swaps); 3] interest risk analytics and credit risk analytics.

Instructor and tutors:

Frank XING, fxing@comp.nus.edu.sg
TA1: Joel QUEK; TA2: Qi QI; TA3: SUN Jiaze
TA4: TBD; TA5: TBD

Course credits and logistics:

4 credit units, weekly in COM3-MPH
L1: Thu 12:00-14:00
Office hour: TBD (booking link: TBD)
Final exam date: 27 APR 2023 09:00-11:00

Prerequisites:

- BT2101 “Econometrics Modeling for Business Analytics”
- BT2102 “Data Management and Visualisation”

ILO (Intended learning objectives):

- Understand the fundamentals of financial risk management and financial instruments.
- Develop the competency in applying analytics for financial services using analytical tools.
- Develop the know-how of building analytical models using financial datasets.

Assessment:

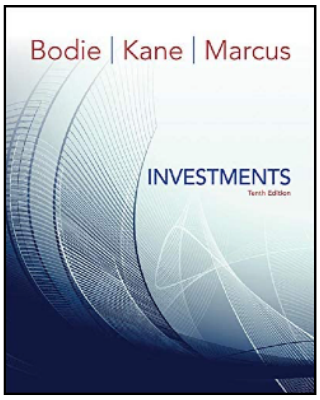
Participation (5%)
Assignments (2* 10% = 20%)
Practice Questions (4* 2% = 8%)
Course project (30%)
Final Exam (37%)

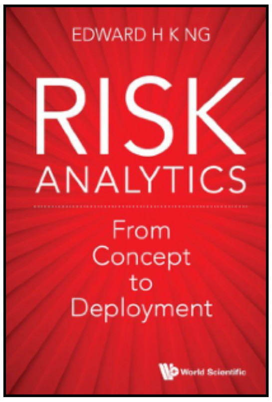
Reference materials:

1> Investments: Tenth Edition (BKM, 2014)

2> Risk Analytics: From Concept to Deployment (RA, 2021)

3> Course materials (lecture and tutorial slides)





Tentative Lesson Plan:

Week and Date	Lecture Topic	Tutorial Topic	Reference Chapters	Dues
Week 1	Introduction to Risk and Return	******	BKM Ch 5	Team up
Week 2	Portfolio Theory and CAPM	******	BKM Ch 6,7,8,9	******
Week 3	APT, Stock Valuation, and Efficient Market Hypothesis	Volatility and betas	BKM Ch 10,11,18	******
Week 4	VaR and Expected Short-Fall	Hands on portfolio optimization		Q1
Week 5	VaR and Back-testing	Hands on VaR		******
Week 6	Basics of Fixed Income Securities	Hands on Backtesting	BKM Ch 14,15	******
Recess Week	******	******	******	******

Week 7	Options: Pay-off and Put-Call Parity	Bond valuation	BKM Ch 20	A1
Week 8	Options: Pricing	Simulating options	BKM Ch 21	Q2,R1
Week 9	Predicting Financial Distress: Z-Score	BS pricing model		******
Week 10	Option Risk Management	Loan default prediction	******	Q3
Week 11	Futures, Swap and Risk Management	Consultation and PQ review	BKM Ch 22,23	******
Week 12	NUS Wellbeing day break	******	******	Q4,A2
Week 13	Credit Risk and Review for final exam	******	******	R2