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, default rate, 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:

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TA1: Qi QI;
TA2: Frank XING;
TA3: SUN Jiaze;
TA4: SUN Yichen
(contactable on Canvas)

Course credits and logistics:

4 credit units, weekly
L1: Thu 12:00-14:00 (location: COM1-0206, COM3-MPH from week 3)
T1: Thu 14:00-15:00; T2: Thu 15:00-16:00; T3: Thu 16:00-17:00; T4: Fri 11:00-12:00
(all tutorial locations: I3-0344)
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/Attendance (5%)

Assignment (15%)

Practice Questions (12%: 3% x 4 times)

Course project (28%)

Final Exam (40%)

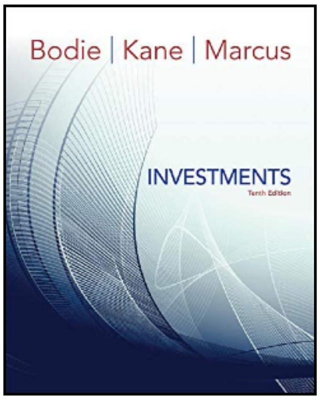
5% + 15% + 12% + 28% + 40% = 100%

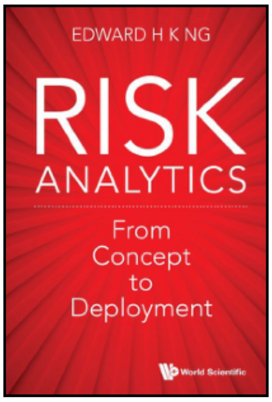
Reference materials:

1> Investments: Tenth Edition (BKM, 2014)

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

3> Course materials (lecture and tutorial slides)





Lesson Plan:

Week and Date	Lecture Topic	Tutorial Topic	Reference Chapters	Dues
Week 1	Introduction to Risk and Return	******	BKM Ch 5	******
Week 2	Portfolio Theory and CAPM	******	BKM Ch 6,7,8,9	******
Week 3	Equity Valuation and Market Efficiency	Hands on volatility and betas	BKM Ch 10,11,18	******
Week 4	VaR and ES (I)	Hands on portfolio optimization		Q1
Week 5	VaR and ES (II)	Hands on estimation		Project team within tutorials
Week 6	Basics of Fixed Income Securities	Hands on backtesting	BKM Ch 14,15	Q2
Recess Week	******	******	******	******

Week 7	Options: Concepts and Pay-off	Bond valuation	BKM Ch 20	Assignment
Week 8	Options: Pricing	Simulating options	BKM Ch 21	******
Week 9	Options: Advanced topics	Black-Scholes pricing model		Q3
Week 10	Consumer Credit Risk	Loan default prediction	******	******
Week 11	Corporate Credit Risk	Assignment feedback and project consultation	BKM Ch 22,23	Q4
Week 12	NUS Wellbeing day break	******	******	******
Week 13	Other derivatives, risk management and Review for the final exam	******	******	Project Report

* Due dates of assignment (W7: Feb 27th 2023) and team project (W13: Apr 16th 2023) are strict and no extension will be made.