

COURSE OUTLINE: BF2214/BF2223 FinTech in Investment Management

Academic Year	2022-23	Semester	2
Course Coordinator	Cheryl Chan		
Course Code	BF2214/BF2223		
Course Title	Fintech in Investment Management		
Pre-requisites	AB1201		
No of AUs	3		
Contact Hours	3 hours seminar x 13 weeks = 39 hours		
Proposal Date	21/11/2022		

A) Course Aims

This course introduces you to several topics in financial technology (FinTech) and its applications in investment management. We will cover cryptocurrency and blockchain technology, innovations in the payment system, marketplace lending, and technology innovations in the insurance industry. The course will provide you with a comprehensive understanding of the business models under these innovations, the challenges FinTech firms face, and the major concerns financial regulators have. The course provides the necessary knowledge for those interested in a career in the FinTech industry, but it also helps you understand how financial technology innovations affect our daily lives. The course is a prescribed elective for all banking and finance students and an elective for all other NBS students.

B) Intended Learning Outcomes (ILO)/Objectives

By the end of this course, you should be able to:

1. To be familiarized with blockchain technologies and crypto landscape
2. To be familiarized with mechanism design, regulatory and other investment, or start-up considerations
3. To be familiarized with payment innovations, peer to peer lending, robo-advisory and other fintech trends

C) Course Content

Blockchain:
 Consensus, primitives
 Web3 Landscape – L1/L2, Defi, Cefi, Infrastructure, NFT, Gamefi
 Incentive Design, Tokenomics
 Regulatory landscape

Other Fintech:
 Payment innovations
 InsurTech
 Roboadvisiry
 Peer to peer lending

D) Assessment (includes both continuous and summative assessment)

Component	ILO Tested	NBS Learning Goal (Refer to Appendix E for list)	Weighting	Team/Individual	Assessment Rubrics (Please insert rubrics as Appendix)
1. Two Quizzes (MCQ)	LO1, LO2, LO3	Critical Thinking	Quiz 1-15% Quiz 2-15%	Individual	Critical Thinking (Annex B1)
2. Case Study Project (written report and in-class presentation)	LO1, LO2, LO3	Critical Thinking, Oral Communication, Teamwork and Interpersonal Skills	Report 20%	Report-team and adjust based on peer evaluations	Critical Thinking (Annex B1), Teamwork and Interpersonal Skills (Annex B3)
			Presentation 10%	Presentation-individual	Communication (Annex B4)
3. Group Assignment (written report and in-class presentation)	LO1, LO2	Critical Thinking, Teamwork and Interpersonal Skills	Report 20%	Team	Critical Thinking (Annex B1), Teamwork and Interpersonal Skills (Annex B3)
4. Class Participation	LO1, LO2, LO3	Class Participation	20%	Individual	Class Participation (Annex B2)
Total			100%		

Notes:

- Each group only needs to submit one written report, but all members have to present a part of your case study in the last class.
- Peer Evaluation Instructions

All members are required to complete a peer evaluation for each member of the team (i.e., including a self-assessment). The completed peer evaluation form must be submitted individually to the instructor immediately after the team project has been submitted for grading. Identity of appraisers will be kept **confidential** and will not be revealed to other team members.

We will use a member's ratings (on a scale ranging from 1 to 7) to award marks for the team project to other members by computing the average rating that a member receives from other members (i.e., excluding each member's self-rating). Each member will be informed of his/her average rating. A member's mark for the team project will be computed as follows:

- If a member's average rating is ≥ 4 , the member will receive **100%** of the overall mark awarded to the team project.

2. If a member's average rating is < 4 but ≥ 3 , the member will receive **80%** of the overall mark awarded to the team project.
3. If a member's average rating is < 3 but ≥ 2 , the member will receive **50%** of the overall mark awarded to the team project.
4. If a member's average rating is < 2 , the member will receive **30%** of the overall mark awarded to the team project.

A member who has concerns with the ratings given by other team members and/or his/her average rating should immediately consult his/her instructor upon receiving his/her peer evaluation feedback.

E) Formative feedback

You will receive both written and verbal feedback from me about group projects and assignments.

F) Learning and Teaching approach

Approach	How does this approach support you in achieving the learning outcomes?
Lectures	<i>The interactive lecture session where there are ample opportunities for open discussion on the conceptual questions raised in the class allows you to think critically and share your ideas and concept with the class. Industry experts will be invited to give lectures on relevant topics.</i>
Case Studies	<i>Case studies would allow you to use the concepts learned in class on real-world examples, and practice teamwork and presentation skills.</i>
In-Class discussions	<i>In-class discussions are highly encouraged, which can allow you to think critically and practice communication skill.</i>

G) Reading and References

There is no standard textbook in Fintech, but the following book is recommended for Bitcoin:

Narayanan, Arvind, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. *Bitcoin and cryptocurrency technologies: a comprehensive introduction*. Princeton University Press, 2016.

Will include readings as we go

H) Course Policies and Student Responsibilities**(1) General**

You are expected to complete all assigned pre-class readings and activities, attend all seminar classes punctually and take all scheduled assignments and tests by due dates. You are expected to take responsibility to follow up with course notes, assignments and course related announcements for seminar sessions they have missed. You are expected to participate in all seminar discussions and activities.

(2) Absenteeism

Absence from class without a valid reason will affect your overall course grade. Valid reasons include falling sick and participation in NTU's approved activities supported by an excuse letter from the relevant bodies.

If you miss a lecture, you must inform the course instructor via email prior to the start of the class.

I) Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [academic integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

J) Course Instructors

Instructor	Office Location	Phone	Email	Consultation Hours
Cheryl chan				By appointment

K) Planned Weekly Schedule

Week	Topic	ILO	Readings/ Activities
1	General Introduction	LO1	Lecture Notes
2	Blockchain Primitives	LO1	Ch1, Ch2, Ch3 of <i>Bitcoin and cryptocurrency technologies</i> Lecture Notes
3	Web3 Landscape	LO1	Lecture Notes

4	Web3 Landscape continued	LO1	Lecture Notes
5	Web3 Landscape continued	LO1	Lecture Notes
6	Cryptocurrency Incentive Design, Tokenomics	LO2	Lecture Notes
7	Web3 Regulation and Law	LO2	Lecture Notes
8	Building a web3 company	LO2	Lecture Notes
9	Payment Innovations	LO3	Lecture Notes
10	InsurTech	LO3	Lecture Notes
11	Roboadvisory	LO3	Lecture Notes
12	Peer to peer lending	LO3	Lecture Notes
13	Case Study Presentation	LO1, LO2, LO3	

ANNEX B: ASSESSMENT CRITERIA**Annex B1: Critical Thinking Rubric**

Traits	Performance	
Identifies and summarizes the issue at hand.	Not Yet Does not identify and summarize the issue, is confused or represents the issue inaccurately.	Substantially Developed Identifies the main issue and its implicit aspects, addresses their relationships to each other and recognizes nuances of the issue.
	Evaluation: Not Yet <u> 1 </u> <u> 2 </u> <u> 3 </u> <u> 4 </u> <u> 5 </u> <u> 6 </u> <u> 7 </u> <u> 8 </u> <u> 9 </u> <u> 10 </u> Substantially Developed	
Identifies and considers other theoretical perspectives that are important to the analysis of the issue	Not Yet Deals only with a single perspective and fails to discuss other possible perspectives, especially those salient to the issue. Fails to identify or hastily dismisses strong, relevant counter-arguments.	Substantially Developed Addresses perspectives noted previously, and additional diverse perspectives drawn from outside information. Identifies the salient arguments (reasons and claims) pro and con.
	Evaluation: Not Yet <u> 1 </u> <u> 2 </u> <u> 3 </u> <u> 4 </u> <u> 5 </u> <u> 6 </u> <u> 7 </u> <u> 8 </u> <u> 9 </u> <u> 10 </u> Substantially Developed	
<u>Identifies and assesses the quality of supporting data/evidence and provides additional data/evidence related to the issue.</u>	Not Yet Merely repeats information provided, taking it as truth, or denies evidence without adequate justification. Confuses associations and correlations with cause and effect.	Substantially Developed <u>Examines the evidence and source of evidence; questions its accuracy, precision, relevance, and completeness. Observes cause and effect and addresses existing or potential consequences.</u>
	Evaluation: Not Yet <u> 1 </u> <u> 2 </u> <u> 3 </u> <u> 4 </u> <u> 5 </u> <u> 6 </u> <u> 7 </u> <u> 8 </u> <u> 9 </u> <u> 10 </u> Substantially Developed	
Identifies and considers key assumptions and the influence of the context on the issue.	Not Yet Does not surface the assumptions of the author and does not examine the contexts, e.g., cultural, and political.	Substantially Developed Identifies and questions the validity of the assumptions and analyzes the issue with a clear sense of scope and context.
	Evaluation: Not Yet <u> 1 </u> <u> 2 </u> <u> 3 </u> <u> 4 </u> <u> 5 </u> <u> 6 </u> <u> 7 </u> <u> 8 </u> <u> 9 </u> <u> 10 </u> Substantially Developed	
Identifies and assesses conclusions, implications and consequences	Not Yet Fails to identify conclusions, implications, and consequences of the issue or the key relationships among the various elements such as context, evidence or assumptions. Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.	Substantially Developed Identifies and discusses conclusions, implications, and consequences, considering context, assumptions, data, and evidence. Objectively reflects upon own assertions. Draws warranted, judicious, non-fallacious conclusions.
	Evaluation: Not Yet <u> 1 </u> <u> 2 </u> <u> 3 </u> <u> 4 </u> <u> 5 </u> <u> 6 </u> <u> 7 </u> <u> 8 </u> <u> 9 </u> <u> 10 </u> Substantially Developed	

Annex B2: Class Participation (Assessed by Class Participation)

Traits		Performance									
		Evaluation: Not Yet 1 2 3 4 5 6 7 8 9 10 Substantially Developed									
		Not Yet					Substantially Developed				
<u>Engagement</u>	<ul style="list-style-type: none"> Engagement Listening 	Hardly focuses in class (e.g. using mobile phone, unnecessary chatting)					Engages fully in class				
<u>Contribution frequency</u>	<ul style="list-style-type: none"> Frequency of contribution 	Does not speak up/contribute in class					Speaks up/contributes in all classes				
<u>Contribution quality</u>	<ul style="list-style-type: none"> Quality of contribution Contribution substance 	No contributions/Contributions lack substance					Contributions are constructive and insightful				

Annex B3: Teamwork & Interpersonal Skills (Peer Evaluation) Rubric**Learning Objective: The ability to work effectively with others in a group setting.**

Traits	Performance	
<p><u>1. Roles and Responsibility (RR)</u></p> <p>Behaves professionally by upholding responsibility and assuming accountability for self and others in progressing towards the team's goal.</p>	<p>Scant</p> <p>Unclear about his/her own role; refuses to take a role in the group; insists to work individually and has limited coordination or communication with others.</p>	<p>Substantially Developed</p> <p>Always fulfills responsibilities; performs his/her role within the group with enthusiasm and demonstrates willingness to work collaboratively.</p>
<p>Evaluation: Scant <u>1 2 3 4 5 6 7</u> Substantially Developed</p>		
<p><u>2. Communication (CM)</u></p> <p>Identifies appropriate mechanisms to coordinate and correspond with team members.</p>	<p>Scant</p> <p>Modes of communication are not appropriate, causing confusion and miscommunication among team members.</p>	<p>Substantially Developed</p> <p>Modes of communication are appropriate, and maintaining timely communication and correspondence with team members.</p>
<p>Evaluation: Scant <u>1 2 3 4 5 6 7</u> Substantially Developed</p>		
<p><u>3. Conflict Resolution (CR)</u></p> <p>Resolves conflicts using a variety of approaches.</p>	<p>Scant</p> <p>Does not recognize conflicts or is unwilling to resolve conflicts.</p>	<p>Substantially Developed</p> <p>Consistently resolves conflicts through facilitating open discussion and compromise.</p>
<p>Evaluation: Scant <u>1 2 3 4 5 6 7</u> Substantially Developed</p>		
<p><u>4. Contributions (CT)</u></p> <p>Contributes positive input for the team; effectively utilizes one's knowledge and expertise.</p>	<p>Scant</p> <p>Largely disinterested in working in a group and refuses to participate; observes passively or is unwilling to share information with other team members.</p>	<p>Substantially Developed</p> <p>Actively attends and participates in all activities and provides meaningful contribution in articulating ideas and opinions.</p>
<p>Evaluation: Scant <u>1 2 3 4 5 6 7</u> Substantially Developed</p>		
<p><u>5. Relationship (RS)</u></p> <p>Maintains cooperative interaction with other team members regardless of individual /cultural differences and respects diverse perspectives.</p>	<p>Scant</p> <p>Rarely listens to others and does not acknowledge the opinions that differ from his/her own.</p>	<p>Substantially Developed</p> <p>Engages in respectful relationships with all other members in the team. Embraces and accepts diverse points of view without prejudice.</p>
<p>Evaluation: Scant <u>1 2 3 4 5 6 7</u> Substantially Developed</p>		

Annex B4: Communication Rubric (Oral)

Learning Objective: The ability to communicate well with others verbally so that it clearly expresses the intended message and is understandable and useful to the receiving party.

Traits		Performance											
		Not Yet	1	2	3	4	5	6	7	8	9	10	Substantially Developed
		Not Yet											Substantially Developed
<u>Communication Outcome</u>	<ul style="list-style-type: none"> Has a clear message for audience Maximizes likelihood of audience accepting the message 	Central message is not explicitly stated in the presentation. Main points are not clearly identified, audience unsure of the direction of the message.											Central message is precisely stated; main points are clearly identified.
<u>Situational Factors</u>	<ul style="list-style-type: none"> Addresses audience needs Builds rapport with audience 	Topic is irrelevant to audience needs and interest. No attempt made to connect topic to audience.											Connection of topic to audience needs and interest is stated with sophistication. Identifies and expresses a deep understanding of the target audience.
<u>Design Factors</u>	<u>Content</u> <ul style="list-style-type: none"> Presents relevant information Supports main points with strong evidence 	Content is erroneous or irrelevant; references and supporting materials are absent. Lacks of depth in content and little insights are exhibited. Presentation falls outside set time parameters.											Content is accurate, thorough, and directly on point; strong support and references are provided. Exhibits depth and insight in content. Effective use of time and stays within time parameters.
	<u>Structure</u> <ul style="list-style-type: none"> Organises content coherently Signals transitions between points 	Organizational pattern (specific introduction and conclusion, sequenced materials within the body, and transitions) is not observable.											Organizational pattern is clearly and consistently observable and makes the content of the presentation cohesive.
	<u>Verbal</u> <ul style="list-style-type: none"> Speaks at appropriate speed and volume Uses correct grammar and pronunciation 	Grammar, pronunciation and word choice are deficient. Vocal delivery is too soft or too fast to understand; gap-fillers interfere with expression.											Free of errors in grammar and pronunciation; good choices of word enhance clarity of expression. Vocal delivery is varied and dynamic. Speech rate, volume, and tone facilitate audience comprehension. Minimal gap fillers.
	<u>Non-Verbal</u> <ul style="list-style-type: none"> Establishes eye contact Uses gestures and movement to convey energy and confidence 	Eye contact, posture, gestures, movement and facial expressions are inappropriate and significantly distracting.											Eye contact, posture, gestures, movement and facial expressions make the presentation compelling, and speaker appears polished and confident.

ANNEX C: CURRENT COURSE OUTLINE**COURSE OUTLINE: BF2214/BF2223 FinTech in Investment Management**

Academic Year	2022-23	Semester	1
Course Coordinator	Wang Xin		
Course Code	BF2214/BF2223		
Course Title	Fintech in Investment Management		
Pre-requisites	AB1201		
No of AUs	3		
Contact Hours	3 hours seminar x 13 weeks = 39 hours		
Proposal Date	11/05/2022		
A) Course Aims			
<p>This course introduces you to several topics in financial technology (FinTech) and its applications in investment management. We will cover cryptocurrency and blockchain technology, innovations in the payment system, marketplace lending, and technology innovations in the insurance industry. The course will provide you with a comprehensive understanding of the business models under these innovations, the challenges FinTech firms face, and the major concerns financial regulators have. The course provides the necessary knowledge for those interested in a career in the FinTech industry, but it also helps you understand how financial technology innovations affect our daily lives. The course is a prescribed elective for all banking and finance students and an elective for all other NBS students.</p>			
B) Intended Learning Outcomes (ILO)/Objectives			
<p>By the end of this course, you should be able to:</p> <ol style="list-style-type: none"> 1. Explain blockchain and distributed ledger technologies and their applications 2. Identify the impacts of innovations in the payment systems on banking and monetary policies 3. Evaluate robo-advisors 			
C) Course Content			
<ul style="list-style-type: none"> • Cryptocurrency and Blockchain Technology • Innovations in the Payment System • Marketplace Lending and Crowdfunding • Technology Innovations in the Insurance Industry • Big Data and Machine Learning in Finance 			

D) Assessment (includes both continuous and summative assessment)

Component	ILO Tested	NBS Learning Goal (Refer to Appendix E for list)	Weighting	Team/Individual	Assessment Rubrics (Please insert rubrics as Appendix)
5. Two Quizzes (closed-book, multiple choice and essay questions)	ILO1, ILO2, ILO3	Critical Thinking	Quiz 1-15% Quiz 2-15%	Individual	Critical Thinking
6. Case Study Project (written report and in-class presentation)	ILO1	Critical Thinking	Report 20% Presentation 10%	Report-team and adjust based on peer evaluations Presentation-individual	Critical Thinking
7. Homework Assignments (multiple)	ILO1, ILO2, ILO3	Problem Solving and Decision Making	30%	Individual	Problem Solving and Decision Making
8. Class Participation	ILO1, ILO2, ILO3	Class Participation	10%	Individual	Class Participation
Total			100%		

Notes:

1. Each group only needs to submit one written report, but all members have to present a part of your case study in the last class.

2. Peer Evaluation Instructions

All members are required to complete a peer evaluation for each member of the team (i.e., including a self-assessment). The completed peer evaluation form must be submitted individually to the instructor immediately after the team project has been submitted for grading. Identity of appraisers will be kept **confidential** and will not be revealed to other team members.

We will use a member's ratings (on a scale ranging from 1 to 7) to award marks for the team project to other members by computing the average rating that a member receives from other members (i.e., excluding each member's self-rating). Each member will be informed of his/her average rating. A member's mark for the team project will be computed as follows:

5. If a member's average rating is ≥ 4 , the member will receive **100%** of the overall mark awarded to the team project.
6. If a member's average rating is < 4 but ≥ 3 , the member will receive **80%** of the overall mark awarded to the team project.
7. If a member's average rating is < 3 but ≥ 2 , the member will receive **50%** of the overall mark awarded to the team project.
8. If a member's average rating is < 2 , the member will receive **30%** of the overall mark awarded to the team project.

A member who has concerns with the ratings given by other team members and/or his/her average rating should immediately consult his/her instructor upon receiving his/her peer evaluation feedback.

E) Formative feedback

You will receive both written and verbal feedback from me about your group case studies and presentations. You will also receive written feedback in response to your homework assignments and take-home exams. I will also give oral feedback through in-class discussion.

F) Learning and Teaching approach

Approach	How does this approach support you in achieving the learning outcomes?
Lectures	<i>The interactive lecture session where there are ample opportunities for open discussion on the conceptual questions raised in the class allows you to think critically and share your ideas and concept with the class. Industry experts will be invited to give lectures on relevant topics.</i>
Case Studies	<i>Case studies would allow you to use the concepts learned in class on real-world examples, and practice teamwork and presentation skills.</i>

<i>Individual assignment(s)</i>	<i>The assignments require you to interpret the materials taught in class and can use them to analyze new problems.</i>
<i>In-Class discussions</i>	<i>In-class discussions are highly encouraged, which can allow you to think critically and practice communication skill.</i>

G) Reading and References

There is no standard textbook in Fintech, but the following book is recommended for Bitcoin:

Narayanan, Arvind, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. *Bitcoin and cryptocurrency technologies: a comprehensive introduction*. Princeton University Press, 2016.

For other topics, I will distribute handouts in class. Some relevant articles are listed in the following, but it is not a comprehensive list and subject to change. You are not required to read all the articles.

Cong, Lin William, and Zhiguo He. *Blockchain disruption and smart contracts*. No. w24399. National Bureau of Economic Research, 2018.

Li, Jiasun, and William Mann. "Initial coin offering and platform building." (2018).

Vallee, Boris, and Yao Zeng. "Marketplace Lending: A New Banking Paradigm?." (2018).

Parlour, Christine A., Uday Rajan, and Johan Walden. "Making Money: Commercial Banks, Liquidity Transformation and the Payment System." (2017).

Kahn, Charles M., and William Roberds. "Why pay? An introduction to payments economics." *Journal of Financial Intermediation* 18, no. 1 (2009): 1-23.

Xu, Ting. "Learning from the crowd: The feedback value of crowdfunding." (2017).

de Roure, Calebe, Lorian Pelizzon, and Anjan V. Thakor. "P2P lenders versus banks: Cream skimming or bottom fishing?." (2018).

D'Acunto, Francesco, Nagpurnanand Prabhala, and Alberto Rossi. "The promises and pitfalls of robo-advising." (2017).

Yuan, Yong, Feiyue Wang, Juanjuan Li, and Rui Qin. "A survey on real time bidding advertising." In *Service Operations and Logistics, and Informatics (SOLI), 2014 IEEE International Conference on*, pp. 418-423. IEEE, 2014

H) Course Policies and Student Responsibilities**(1) General**

You are expected to complete all assigned pre-class readings and activities, attend all seminar classes punctually and take all scheduled assignments and tests by due dates. You are expected to take responsibility to follow up with course notes, assignments and course related announcements for seminar sessions they have missed. You are expected to participate in all seminar discussions and activities.

(2) Absenteeism

Absence from class without a valid reason will affect your overall course grade. Valid reasons include falling sick supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies.

If you miss a lecture, you must inform the course instructor via email prior to the start of the class.

I) Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [academic integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

J) Course Instructors

Instructor	Office Location	Phone	Email	Consultation Hours
Wang Xin	S3-B1B-60	6790-5706	xin.wang@ntu.edu.sg	By appointment

K) Planned Weekly Schedule

Week	Topic	ILO	Readings/ Activities
1	General Introduction to FinTech	LO1	Lecture Notes
2	Bitcoin Mining and Trading	LO2	Ch1, Ch2, Ch3 of <i>Bitcoin and cryptocurrency technologies</i> Lecture Notes
3	Blockchain & Smart Contracts	LO2	Lecture Notes

4	Decentralized finance & NFT	LO1, LO2, LO3	Lecture Notes
5	Initial Coin Offering & Review for Quiz 1	LO1, LO2	Lecture Notes
6	Crowdfunding and Peer-to-Peer Lending & Quiz 1	LO1	Lecture Notes
7	Payment Innovations	LO1, LO3	Lecture Notes
8	InsurTech	LO3	Lecture Notes
9	Big Data and Machine Learning in Finance	LO1, LO2	Lecture Notes
10	Robo-advisor & Quiz 2	LO1, LO2	Lecture Notes
11	High-frequency Trading	LO1	Lecture Notes
12	Digital Trade Finance	LO1	Lecture Notes
13	Case Study Presentation	LO1, LO2, LO3	

ANNEX A: ASSESSMENT CRITERIA**Critical Thinking Rubric**

Traits	Performance	
Identifies and summarizes the issue at hand.	Not Yet Does not identify and summarize the issue, is confused or represents the issue inaccurately.	Substantially Developed Identifies the main issue and its implicit aspects, addresses their relationships to each other and recognizes nuances of the issue.
Evaluation: Not Yet <u> 1 </u> <u> 2 </u> <u> 3 </u> <u> 4 </u> <u> 5 </u> <u> 6 </u> <u> 7 </u> <u> 8 </u> <u> 9 </u> <u> 10 </u> Substantially Developed		
Identifies and considers other theoretical perspectives that are important to the analysis of the issue	Not Yet Deals only with a single perspective and fails to discuss other possible perspectives, especially those salient to the issue. Fails to identify or hastily dismisses strong, relevant counter-arguments.	Substantially Developed Addresses perspectives noted previously, and additional diverse perspectives drawn from outside information. Identifies the salient arguments (reasons and claims) pro and con.
Evaluation: Not Yet <u> 1 </u> <u> 2 </u> <u> 3 </u> <u> 4 </u> <u> 5 </u> <u> 6 </u> <u> 7 </u> <u> 8 </u> <u> 9 </u> <u> 10 </u> Substantially Developed		
<u>Identifies and assesses the quality of supporting data/evidence and provides additional data/evidence related to the issue.</u>	Not Yet Merely repeats information provided, taking it as truth, or denies evidence without adequate justification. Confuses associations and correlations with cause and effect.	Substantially Developed <u>Examines the evidence and source of evidence; questions its accuracy, precision, relevance, and completeness. Observes cause and effect and addresses existing or potential consequences.</u>
Evaluation: Not Yet <u> 1 </u> <u> 2 </u> <u> 3 </u> <u> 4 </u> <u> 5 </u> <u> 6 </u> <u> 7 </u> <u> 8 </u> <u> 9 </u> <u> 10 </u> Substantially Developed		
Identifies and considers key assumptions and the influence of the context on the issue.	Not Yet Does not surface the assumptions of the author and does not examine the contexts, e.g., cultural, and political.	Substantially Developed Identifies and questions the validity of the assumptions and analyzes the issue with a clear sense of scope and context.
Evaluation: Not Yet <u> 1 </u> <u> 2 </u> <u> 3 </u> <u> 4 </u> <u> 5 </u> <u> 6 </u> <u> 7 </u> <u> 8 </u> <u> 9 </u> <u> 10 </u> Substantially Developed		
Identifies and assesses conclusions, implications and consequences	Not Yet Fails to identify conclusions, implications, and consequences of the issue or the key relationships among the various elements such as context, evidence or assumptions. Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.	Substantially Developed Identifies and discusses conclusions, implications, and consequences, considering context, assumptions, data, and evidence. Objectively reflects upon own assertions. Draws warranted, judicious, non-fallacious conclusions.
Evaluation: Not Yet <u> 1 </u> <u> 2 </u> <u> 3 </u> <u> 4 </u> <u> 5 </u> <u> 6 </u> <u> 7 </u> <u> 8 </u> <u> 9 </u> <u> 10 </u> Substantially Developed		

Problem Solving and Decision-Making Rubric

Traits		Performance										
<u>Calculation</u>	Ability to perform calculations.	Not Yet Calculations are attempted but are both unsuccessful and are not comprehensive.	Substantially Developed Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.).									
		Evaluation: Not Yet <u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u> <u>6</u> <u>7</u> <u>8</u> <u>9</u> <u>10</u> Substantially Developed										
<u>Application/Analysis</u>	Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis.	Not Yet Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is uncertain about drawing conclusions from this work.	Substantially Developed Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.									
		Evaluation: Not Yet <u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u> <u>6</u> <u>7</u> <u>8</u> <u>9</u> <u>10</u> Substantially Developed										

Class Participation (Assessed by Class Participation)

Traits	Performance		
	1	2	3
Engagement	Hardly focuses in class (e.g. using mobile phone, unnecessary chatting)	Occasionally engages in distracting activities (e.g. using mobile phone, unnecessary chatting) in class.	Engages fully in class
Contribution frequency	Does not speak up/contribute in class	Occasionally speaks up/contributes in class	Speaks up/contributes in all classes
Contribution quality	No contributions/Contributions lack substance	Contributions demonstrate knowledge of subject matter	Contributions are constructive and insightful

Teamwork & Interpersonal Skills (Peer Evaluation) Rubric

Learning Objective: The ability to work effectively with others in a group setting.

Traits	Performance	
<p><u>1. Roles and Responsibility (RR)</u></p> <p>Behaves professionally by upholding responsibility and assuming accountability for self and others in progressing towards the team's goal.</p>	<p>Scant Unclear about his/her own role; refuses to take a role in the group; insists to work individually and has limited coordination or communication with others.</p>	<p>Substantially Developed Always fulfills responsibilities; performs his/her role within the group with enthusiasm and demonstrates willingness to work collaboratively.</p>
<p>Evaluation: Scant <u>1 2 3 4 5 6 7</u> Substantially Developed</p>		
<p><u>2. Communication (CM)</u></p> <p>Identifies appropriate mechanisms to coordinate and correspond with team members.</p>	<p>Scant Modes of communication are not appropriate, causing confusion and miscommunication among team members.</p>	<p>Substantially Developed Modes of communication are appropriate, and maintaining timely communication and correspondence with team members.</p>
<p>Evaluation: Scant <u>1 2 3 4 5 6 7</u> Substantially Developed</p>		
<p><u>3. Conflict Resolution (CR)</u></p> <p>Resolves conflicts using a variety of approaches.</p>	<p>Scant Does not recognize conflicts or is unwilling to resolve conflicts.</p>	<p>Substantially Developed Consistently resolves conflicts through facilitating open discussion and compromise.</p>
<p>Evaluation: Scant <u>1 2 3 4 5 6 7</u> Substantially Developed</p>		
<p><u>4. Contributions (CT)</u></p> <p>Contributes positive input for the team; effectively utilizes one's knowledge and expertise.</p>	<p>Scant Largely disinterested in working in a group and refuses to participate; observes passively or is unwilling to share information with other team members.</p>	<p>Substantially Developed Actively attends and participates in all activities and provides meaningful contribution in articulating ideas and opinions.</p>
<p>Evaluation: Scant <u>1 2 3 4 5 6 7</u> Substantially Developed</p>		
<p><u>5. Relationship (RS)</u></p> <p>Maintains cooperative interaction with other team members regardless of individual/cultural differences and respects diverse perspectives.</p>	<p>Scant Rarely listens to others and does not acknowledge the opinions that differ from his/her own.</p>	<p>Substantially Developed Engages in respectful relationships with all other members in the team. Embraces and accepts diverse points of view without prejudice.</p>
<p>Evaluation: Scant <u>1 2 3 4 5 6 7</u> Substantially Developed</p>		

Communication Rubric (Oral)

Learning Objective: The ability to communicate well with others verbally so that it clearly expresses the intended message and is understandable and useful to the receiving party.

Traits	Performance												
	Not Yet	1	2	3	4	5	6	7	8	9	10	Substantially Developed	
	Not Yet					Substantially Developed							
Communication Outcome	<ul style="list-style-type: none"> Has a clear message for audience Maximizes likelihood of audience accepting the message 	Central message is not explicitly stated in the presentation. Main points are not clearly identified, audience unsure of the direction of the message.					Central message is precisely stated; main points are clearly identified.						
Situational Factors	<ul style="list-style-type: none"> Addresses audience needs Builds rapport with audience 	Topic is irrelevant to audience needs and interest. No attempt made to connect topic to audience.					Connection of topic to audience needs and interest is stated with sophistication. Identifies and expresses a deep understanding of the target audience.						
Design Factors	Content <ul style="list-style-type: none"> Presents relevant information Supports main points with strong evidence 	Content is erroneous or irrelevant; references and supporting materials are absent. Lacks of depth in content and little insights are exhibited. Presentation falls outside set time parameters.					Content is accurate, thorough, and directly on point; strong support and references are provided. Exhibits depth and insight in content. Effective use of time and stays within time parameters.						
	Structure <ul style="list-style-type: none"> Organises content coherently Signals transitions between points 	Organizational pattern (specific introduction and conclusion, sequenced materials within the body, and transitions) is not observable.					Organizational pattern is clearly and consistently observable and makes the content of the presentation cohesive.						
	Verbal <ul style="list-style-type: none"> Speaks at appropriate speed and volume Uses correct grammar and pronunciation 	Grammar, pronunciation and word choice are deficient. Vocal delivery is too soft or too fast to understand; gap-fillers interfere with expression.					Free of errors in grammar and pronunciation; good choices of word enhance clarity of expression. Vocal delivery is varied and dynamic. Speech rate, volume, and tone facilitate audience comprehension. Minimal gap fillers.						
	Non-Verbal <ul style="list-style-type: none"> Establishes eye contact Uses gestures and movement to convey energy and confidence 	Eye contact, posture, gestures, movement and facial expressions are inappropriate and significantly distracting.					Eye contact, posture, gestures, movement and facial expressions make the presentation compelling, and speaker appears polished and confident.						

ANNEX E: LIST OF NBS LEARNING GOALS

LEARNING GOAL	LEARNING OBJECTIVE	CHECK
TASK SKILLS		
Acquisition of Knowledge	<i>Instructors, please define.</i>	<input type="checkbox"/>
Ethical Reasoning	The ability to recognize and understand ethical issues, and apply sound ethical reasoning.	<input type="checkbox"/>
Critical Thinking & Creative Thinking	The ability to define, examine, evaluate, analyze and synthesize various arguments and knowledge to form independent judgment.	<input checked="" type="checkbox"/>
	The ability to provide insight in an innovative way characterized by high degree of adaptiveness.	<input type="checkbox"/>
Problem Solving & Decision Making	The ability to identify problem, generate a plan to solve problem, implement and evaluate the plan and make sound business decision.	<input checked="" type="checkbox"/>
Planning & Execution	The ability to set clear priorities and plans of action for the task and define task objectives to fulfill goals within a planned schedule for execution.	<input type="checkbox"/>
PEOPLE SKILLS		
Oral Communication & Written Communication	The ability to communicate well with others verbally so that it clearly expresses the intended message and is understandable and useful to the receiving party.	<input checked="" type="checkbox"/>
	The ability to communicate well with others in writing so that it clearly expresses the intended message and is understandable and useful to the receiving party.	<input type="checkbox"/>
Negotiation	The ability to systematically plan and prepare for negotiation and apply negotiation skills in personal and professional practice.	<input type="checkbox"/>
Cultural Intelligence	The ability to function effectively in situations characterized by cultural diversity.	<input type="checkbox"/>
Teamwork & Interpersonal Skills	The ability to work effectively with others in a group setting.	<input checked="" type="checkbox"/>
Motivation & Development of Self & Others	The ability to develop a better understanding of one's strengths and weaknesses, and learn to view others and mistakes positively as sources of personal and professional development.	<input type="checkbox"/>

Please write to NBS Accreditation office (nbsacro@ntu.edu.sg) for sample rubrics.