

COURSE OUTLINE: BF3216 Fixed Income Securities

Academic Year	2022-2023	Semester	1
Course Coordinator	Loh Yu Sheng		
Course Code	BF3216		
Course Title	Fixed Income Securities		
Pre-requisites	AB1201 & BF2219 or RE8005 & BF2219		
No of AUs	3		
Contact Hours	3 x 13 weeks = 39 hrs		
Proposal Date	18 Jan 2022		

A) Course Aims

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

1. Price a wide range of fixed income securities
2. Understand the structure of different fixed income securities
3. Learn how to manage the risks of fixed income securities

This class is targeted at finance majors and students in closely related disciplines who are interested in learning about fixed income securities and pursuing a career in fields such as asset management, wealth management, insurance, and banking.

B) Intended Learning Outcomes (ILO)/Objectives

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

1. Describe the structures of different fixed income securities and explain the reasons for the different structures
2. Price a wide variety of fixed income securities using no-arbitrage principles
3. Analyze the risks of various fixed income securities and apply risk management techniques
4. Evaluate specific situations in the fixed income market and recommend a course of action

C) Course Content

This course covers bond pricing and yields; duration and convexity; convertible bonds; callable bonds; asset-liability matching; term structure, spot rates, and forward rates; credit risk; pricing interest rate derivatives; swaps and credit default swaps

D) Assessment (includes both continuous and summative assessment)

Component	ILO Tested	NBS Learning Goal (Refer to Appendix 1 for list)	Weightage	Team/Individual	Assessment Rubrics (attach rubrics in appendix)
1. Final Examination	ILO1, ILO2, ILO3, ILO4	Acquisition of knowledge, problem solving and decision	50%	Individual	N.A.

		making, and critical			
2. Assignment	ILO1, ILO2, ILO3	Problem Solving and Decision Making	20%	Individual	Refer to Appendix
3. Group project (Written report and class presentation)	ILO1, ILO2, ILO3, ILO4	Problem solving and decision making; Creative Thinking; Oral Communication; Written Communication; Teamwork and Interpersonal Skills	20%	Team* Note: all students will be required to present the class presentation	Refer to Appendix
4. Class participation	ILO1, ILO2, ILO3	Oral Communication	10%	Individual	Refer to Appendix
Total			100%		

* At the end of the semester, you will be asked to complete a teammate assessment form evaluating your teammates' contributions. If your teammates' assessment of your contribution is below a threshold your grade will be reduced. Refer to Appendix 3 for assessment method.

E) Formative feedback

1. You will receive feedback on the individual assignment after it is graded. I will also go through the assignment questions during class time.
2. You will be provided with graded rubrics and written comments for your group project presentation.
3. You will also receive verbal feedback on the questions in the problem sets that we work through in classes.

F) Learning and Teaching approach

Approach	How does this approach support you in achieving the learning outcomes?
Seminars	In the first part of the interactive seminars, concepts and methods are presented to provide students with a structure for analyzing problems. You are encouraged to actively participate in the class discussions.

	In the second part of the seminars, we will work through and discuss problems together. This will ensure you are able to apply the methodologies necessary for working with fixed income securities.
Individual assignments	The assignment requires you to apply what you have learnt in classes to solve the problems involving fixed income securities.
Group project	The group project requires you to not only apply technical skills, but also exercise judgement in applying and interpreting quantitative results. It also assesses your public speaking ability and provides a training ground to hon your presentation skills.

G) Reading and References

“Bond Markets, Analysis, and Strategies” by Frank J. Fabozzi; Eighth Edition, Pearson

Other Resources:

Fixed Income Securities: Tools for Today’s Markets

Bruce Tuckman & Angel Serrat

Third Edition, Wiley Finance

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.

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
Loh Yu Sheng				<i>By appointment</i>

K) Planned Weekly Schedule

Week	Topic	ILO	Readings/ Activities
1	Introduction to fixed income securities	ILO1	Ch. 1, 6, 7, 9
2	Pricing and yields; Repurchase agreements	ILO2	Ch. 2, 3
3	Duration and convexity	ILO3	Ch. 4
4	The term structure, spot rates and forward rates	ILO2, ILO3	Ch. 5
5	Bond portfolio management and asset-liability matching	ILO3, ILO4	Ch. 22, 24
6	Credit risk	ILO2, ILO3, ILO4	Ch. 20, 21
7	Valuing bonds with embedded options	ILO1, ILO2, ILO3	Ch. 17
8	Recess Week		
9	Interest rate derivatives	ILO1, ILO2, ILO3	Ch.26, 27
10	Swaps and credit default swaps	ILO2, ILO3, ILO4	Ch. 28, 29
11	Convertible bonds	ILO1, ILO2	Ch. 19
12	Mortgage backed securities	ILO1, ILO2, ILO3	Ch. 11, 12
13	Mortgage backed securities and asset backed securities	ILO1, ILO2, ILO3, ILO4	Ch. 15

ANNEX A: ASSESSMENT CRITERIA

Appendix 1: Assessment Criteria for Assignment

Learning Objective: Qualitative and Quantitative Reasoning (QQR) is a "habit of mind," competency, and comfort in working with data. Individuals with strong QQR skills possess the ability to reason and solve problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by qualitative argument and quantitative evidence, and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, equations, etc., as appropriate).

Traits		Performance									
		Evaluation: Not Yet 1 2 3 4 5 6 7 8 9 10 Substantially Developed									
		Not Yet					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.	Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is uncertain about drawing conclusions from this work.					Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.				
<u>Calculation</u>	Ability to perform calculations.	Calculations are attempted but are both unsuccessful and are not comprehensive.					Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.).				
<u>Presentation</u>	Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized).	Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support.					Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality.				
<u>Representation</u>	Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words).	Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate.					Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.				

Appendix 2: Assessment Criteria for Participation

Learning Objective: The ability to engage in open-ended and collaborative exchange of ideas among instructor and students for the purpose of furthering students thinking, learning, problem solving and understanding.

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

Appendix 3: Assessment Criteria for Group Project

For written report

Traits	Performance										
	Scant	1	2	3	4	5	6	7	8	9	10
1. Problem statement Identifies the problem and analyze the market prospect.	Scant Unable to identify any real problem. Demonstrates limited understanding of the problem or related contextual factors.	Substantially Developed Problem is clearly identified and stated. Demonstrates the ability to construct a clear and insightful problem statement with evidence of all relevant contextual factors. The market prospect is properly analyzed.									
2. Creativity Solves the problem with creativity.	Scant Ideas are not developed in original and unique ways. Reformulates a collection of available ideas.	Substantially Developed Ideas developed are original. Able to extend a novel idea to create new knowledge that crosses boundaries.									
3. Writing The report should be well organized with supporting evidence and proper analysis. It should be clear without grammar errors and typos.	Scant The report is difficult to follow and has many grammar errors or typos.	Substantially Developed The report is well-written and supplemented with figures, tables, or demos of app.									

For presentation

Traits		Performance									
		Evaluation: 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.

Peer Evaluation Form

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:

1. 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.

CONFIDENTIAL PEER EVALUATION FORM FOR TEAM PROJECT

Member’s name: _____

Seminar group and team number: _____

Please use the attached Peer Evaluation Rubric to evaluate yourself and your team members on each of the 5 stated attributes (on a scale of 1 to 7). State your ratings for yourself and each of your team members in the table below. For your self-assessment, insert “(Self)” after your name in the table below.

Index #	Name of team members	1 - RR	2 - CM	3 - CR	4 - CT	5 - RS	Average Rating
1							
2							
3							
4							
5							
6							

If any of your ratings above is < 4, please provide a brief explanation to justify the ratings.

Index #	Brief explanation to justify a rating of < 4

You may attach supporting documents (like emails and screen shots), if any, to support your explanations above.

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

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

References:

Teamwork Value Rubric - Association of American Colleges and Universities. Retrieved from <http://www.aacu.org/value/rubrics/pdf/teamwork.pdf>

List of NBS Learning Goals

LEARNING GOAL	LEARNING OBJECTIVE	CHECK
TASK SKILLS		
Acquisition of Knowledge	Acquire knowledge of the structure of fixed income securities, the pricing of such securities, and their risks.	<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 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 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 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 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"/>

ANNEX C: COURSE OUTLINE FOR BF3202

Academic Year	2022-2023	Semester	1
Course Coordinator	Xin Deng		
Course Code	BF3202		
Course Title	Fixed Income Securities		
Pre-requisites	AB1201 & BF2219 or RE8005 & BF2219		
No of AUs	4		
Contact Hours	3 x 13 weeks = 39 hrs		
Proposal Date	18 Jan 2022		

A) Course Aims

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

1. Price a wide range of fixed income securities
2. Understand the structure of different fixed income securities
3. Learn how to manage the risks of fixed income securities

This class is targeted at finance majors and students in closely related disciplines who are interested in learning about fixed income securities and pursuing a career in fields such as asset management, wealth management, insurance, and banking.

B) Intended Learning Outcomes (ILO)/Objectives

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

1. Describe the structures of different fixed income securities and explain the reasons for the different structures
2. Price a wide variety of fixed income securities using no-arbitrage principles
3. Analyze the risks of various fixed income securities and apply risk management techniques
4. Evaluate specific situations in the fixed income market and recommend a course of action

C) Course Content

This course covers bond pricing and yields; duration and convexity; convertible bonds; callable bonds; asset-liability matching; term structure, spot rates, and forward rates; credit risk; pricing interest rate derivatives; swaps and credit default swaps

D) Assessment (includes both continuous and summative assessment)

Component	ILO Tested	NBS Learning Goal (Refer to Appendix 1 for list)	Weightage	Team/Individual	Assessment Rubrics (attach rubrics in appendix)
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6. Assignment	ILO1, ILO2, ILO3	Problem Solving and Decision Making	20%	Individual	Refer to Appendix

7. Group project (Written report and class presentation)	ILO1, ILO2, ILO3, ILO4	Problem solving and decision making; Creative Thinking; Oral Communication; Written Communication; Teamwork and Interpersonal Skills	20%	Team* Note: all students will be required to present the class presentation	Refer to Appendix
8. Class participation	ILO1, ILO2, ILO3	Oral Communication	10%	Individual	Refer to Appendix
Total			100%		

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E) Formative feedback

4. You will receive feedback on the individual assignment after it is graded. I will also go through the assignment questions during class time.

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F) Learning and Teaching approach

Approach	How does this approach support you in achieving the learning outcomes?
Seminars	In the first part of the interactive seminars, concepts and methods are presented to provide students with a structure for analyzing problems. You are encouraged to actively participate in the class discussions. In the second part of the seminars, we will work through and discuss problems together. This will ensure you are able to apply the methodologies necessary for working with fixed income securities.
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Other Resources:

Fixed Income Securities: Tools for Today’s Markets

Bruce Tuckman & Angel Serrat

Third Edition, Wiley Finance

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

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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.

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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.

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J) Course Instructors

Instructor	Office Location	Phone	Email	Consultation Hours
Xin Deng	S3-B1A-32		xin.deng@ntu.edu.sg	<i>By appointment</i>

K) Planned Weekly Schedule

Week	Topic	ILO	Readings/ Activities
1	Introduction to fixed income securities	ILO1	Ch. 1, 6, 7, 9
2	Pricing and yields; Repurchase agreements	ILO2	Ch. 2, 3
3	Duration and convexity	ILO3	Ch. 4
4	The term structure, spot rates and forward rates	ILO2, ILO3	Ch. 5
5	Bond portfolio management and asset-liability matching	ILO3, ILO4	Ch. 22, 24
6	Credit risk	ILO2, ILO3, ILO4	Ch. 20, 21
7	Valuing bonds with embedded options	ILO1, ILO2, ILO3	Ch. 17
8	Recess Week		
9	Interest rate derivatives	ILO1, ILO2, ILO3	Ch.26, 27
10	Swaps and credit default swaps	ILO2, ILO3, ILO4	Ch. 28, 29
11	Convertible bonds	ILO1, ILO2	Ch. 19
12	Mortgage backed securities	ILO1, ILO2, ILO3	Ch. 11, 12
13	Mortgage backed securities and asset backed securities	ILO1, ILO2, ILO3, ILO4	Ch. 15