

**PADM-GP-2148**

**Introduction to Structured Finance- Strategies for Municipal, Health, and Corporate Finance  
Spring 2018**

**Wednesday 6:45 to 8:25 (January 24, 2018 – May 2, 2018)  
Waverly, Room 667**

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**Office hours:** Puck, Room 3045, Wednesday 4:00pm-6:00pm and by appointment.

**Course Description:** We will study the process by which financing objectives are transformed into municipal bond transactions and other opportunities to utilize structured finance products in the health and corporate finance sectors. The course will center on case studies of actual bond transactions that financed multiple new money (construction) and refunding projects. We will learn the mathematics underlying financial structure and the governing conventions and vocabulary of structured finance. We will study the instruments of structured finance and how they manifest into structural form. Once we have developed this core understanding, we will review in detail the Official Statements related to the case studies to begin our exploration of the structuring process.

All cash flow elements of the structuring process will be discussed in detail and formulated in EXCEL. Once a sufficient understanding of the purpose and protocols associated with the structuring process is developed, we will explore the bond structuring process using DBC Finance, the industry standard bond structuring software.

**Course Objective:** To develop structured finance proficiency within and without DBC Finance which is a capability that is highly desired by both public and private sector municipal market participants.

**Course Website:** The course website resides on the NYC Classes system and is accessible via the “Academics” tab on NYU Home.

**Course Materials:** I have assigned chapters from the following works.

Securities Industry and Financial Markets Association (SIFMA), *Fundamentals of Municipal Bonds*, 6<sup>th</sup> Ed., Wiley, 2012.

Edward R Tuft, *The Visual Display of Quantitative Information*, Graphics Press, Cheshire, Connecticut (These readings are recommended but not required.)

Frank J. Fabozzi, *Introduction to Fixed Income Analytics: Relative Value Analysis, Risk Measures and Valuation*, John Wiley & Sons. Inc.

Additional readings will be assigned on a weekly basis and made available on the course website. Such readings will include Official Statements for select structured transactions, rating agency structured finance criteria, DBC Finance tutorials and support manuals, and *The Art of Structured Finance* (Wadler).

**Recommended Financial Calculator:** HP 12C

**Assignments and grading:** Two homework assignments: 30%  
Term Project: 40%  
Take home final: 30%

For the Term Project you will select a specific transaction type and fully formulate and model transactional cash flows and sizing elements in EXCEL. You will be responsible for the design and organization of all cash flow and sizing schedules and presentation materials. You will also be required to create the sample transaction in DBC Finance.

**Academic Integrity:** Academic integrity is a vital component of Wagner and NYU. Each student is required to sign and abide by Wagner's Academic Code. Plagiarism of any form will not be tolerated since you have all signed an Academic Oath and are bound by the academic code of the school. Every student is expected to maintain academic integrity and is expected to report violations to me.

**Students with Disabilities:** Academic accommodations are available for students with disabilities. Please visit the Moses Center for Students with Disabilities (CSD) website at [www.nyu.edu/csd](http://www.nyu.edu/csd) and click on the Reasonable Accommodations and How to Register tab or call or e-mail CSD at (212-998-4980 or [mosescsd@nyu.edu](mailto:mosescsd@nyu.edu)) for information. Students who are requesting academic accommodations are strongly advised to reach out to the Moses Center as early as possible in the semester for assistance.

**Attendance:** I will not be keeping track of attendance but strongly encourage you to attend all classes in order that you can achieve a full and proper understanding of the course material.

### **Class 1 – January 24: Introduction**

Syllabus Review  
Overview of Course Objectives  
Discussion on the Nature of Finance (Finance as Convention)  
Discussion of Financing Objectives: New Money  
Refunding/Refinancing  
Defining Structured Finance

**Readings:** *Fundamentals, Chapter 2, The Basics of Municipal Securities*  
*Tufte, Part 1, Graphical Practice, Chapter 1. Graphical Excellence*  
*Fabozzi, Chapter 1, Time Value of Money*

### **Class 2 – January 31: The Mathematics of Cash Flow**

Discussion of readings  
  
Discussion of importance of fundamental understanding  
  
Modeling in EXCEL: Debt service

Accrual periods  
Day-Count protocols  
Compounding  
Present and Future Value

**Readings:** *Fundamentals, Overview of the Municipal Bond Market, Introduction*  
*Fundamentals, The Rating Agencies*  
*Tufte, Part 1, Graphical Practice, Chapter 2. Graphical Integrity*  
*Fabozzi, Chapter 3, Day Count Conventions and Accrued Interest*

### **Class 3 – February 7: The Instruments of Structured Finance**

Discussion of readings

Define: Fixed Rate Bonds  
Variable Rate Bonds  
Current Interest Bonds  
Serial Bonds  
Term Bonds  
Capital Appreciation Bonds  
Hybrids  
Derivatives

Discussion of Yield

Bond Pricing Modeling in EXCEL - Premium Bonds  
Discount Bonds

**Readings:** *Tufte, Part 1, Graphical Practice, Chapter 3, Sources of Graphical Integrity and Sophistication*  
*Fundamentals, The Issuers*  
*Fabozzi, Chapter 5, Yield Measures*

### **Class 4 – February 14: Introduction to Financial Structure**

Discussion of readings

Define: Dated date  
Delivery date  
First interest payment date  
First principal payment date  
Final principal payment date

Introduction to Case Study

Review of Case Study Official Statement

**Readings:** *Tufte, Part II, Theory of Data Graphics, Chapter 4, Data Ink and Graphical Redesign Fundamentals, Understanding Interest Rates*  
*Case Study Official Statement – Term Structure Section*  
*Fabozzi, Chapter 6, Analysis of Floating Rate Securities*

### **Class 5 – February 21: Introduction to New Money Bond Structure**

Discussion of readings

Discussion and examples of Sizing Elements:

- Project Fund
- Capitalized Interest Fund
- Debt Service Reserve Fund
- Cost of Issuance Fund
- Rebate Fund

**Readings:** *Tufte, Part II, Theory of Data Graphics, Chapter 5, Chart Junk: Vibrations, Grids and Ducks*  
*Fundamentals, The Primary Market*  
*Case Study Official Statement – Sources and Uses Sections*  
*Fabozzi, Chapter 2, Yield Curve Analysis*

### **Class 6 – February 28: New Money Cash Flow Modeling**

Discussion of readings

Sources and Uses Table

Define Net Funding and Gross Funding

Modeling New Money Cash Flow Elements in EXCEL

Net Funding of Project Fund

Net Funding of Capitalized Interest Fund

Gross Funding of Debt Service Reserve Fund

Constructing Sources and Uses Table

**Readings:** *Tufte, Part II, Theory of Data Graphics, Chapter 6, Data-Ink Maximization and Graphical Design*  
*Case Study Official Statement – Funding Flows sections*  
*Fabozzi, Chapter 4, Valuation of Option-Free Bonds*

### **Class 7 – March 7: Introduction to Refunding Modeling**

Discussion of readings

Define:       Current Refunding  
                  Advance Refunding  
                  Escrow Requirements  
                  Escrow Securities  
                  Escrow Cash Flow

Modeling Refunding cash flow elements in EXCEL

Escrow requirements  
Escrow portfolio sizing  
Escrow cash flow  
Escrow sufficiency  
Escrow yield

**Readings:**    *Tufte, Part II, Theory of Data Graphics, Chapter 7 Multifunctioning Graphical Elements*  
                  *Fundamentals, Financial Products*  
                  *Refunding Case Study Official Statement - Plan of Finance Sections*  
                  *Fabozzi, Chapter7, Valuation of Bonds with Embedded Options*

## **Class 8 – March 21: Introduction to Structural Forms and Usage**

Discussion of readings

Absolute Structural Forms:    Level Debt Service  
  Level Principal

Relative Structural Forms:    Uniform  
  Accelerated  
  Deferred  
  Proportional

Allocation of Case Study aggregate debt service to underlying financing purposes

Discussion of structural forms and financing purpose

**Readings:**    *Tufte, Part II, Theory of Data Graphics, Chapter 8 Data Density and Small Multiples*  
                  *Fundamentals, Credit Analysis*  
                  *Refunding Case Study Official Statement – Sources and Uses/Debt Service sections*  
                  *Fabozzi, Chapter 16, Analysis of Interest Rate Swaps*

## **Class 9 – March 28: Introduction to DBC Finance #1**

Discussion of readings

Discussion of objectives of the structuring process:      Size the transaction  
   Structure the transaction

Understanding the inputs and outputs of the structuring process

DBC Finance:            Purpose  
                                 Architecture  
                                 Overview of Navigation

Demonstrate structuring of case study new money bonds (Debt/Size Module)

**Readings:**      *Tufte, Part II, Theory of Data Graphics, Chapter 9 Aesthetics and Technique in Data Graphical Design, Epilogue: Designs for the Display of Information*  
                         *DBC Tutorial: Debt/Size*  
                         *Sample Issuer New Money Requests for Proposals*  
                         *Fabozzi, Chapter 12, Measuring Interest Rate Risk*

## **Class 10 – April 4: Introduction to DBC Finance #2**

Discussion of readings

Demonstrate structuring of Case Study Refunding Bonds (Refund Module)

Readings:      *Fundamentals, Financial Products*  
                         *DBC Tutorial: Refund*  
                         *Sample Issuer Refunding Requests for Proposals*  
                         *Fabozzi, Chapter 15, The Tools of Relative Value Analysis*

## **Class 11 – April 11: Introduction to DBC Finance #3**

Discussion of readings

Combining Financing Purposes (Project Finance Module)

**Readings:**      *DBC Tutorial: Project Finance*  
                         *Sample Issuer Requests for Proposals for Complex Finance Plans*  
                         *Sample multi-financing purpose transaction Official Statement*  
                         *Fabozzi, Chapter 17, Estimating Yield Volatility*

## **Class 12 – April 18: Case Study Discussion with Guest Speakers**

Discussion of readings

Issuer

Financial Advisor

**Readings:**     *Fundamentals, The Secondary Market*  
                  *Fabozzi, Chapter 8,,Cash Flow for Mortgage-Backed Securities and Amortizing Asset-Backed Securities*

## **Class 13 – April 25: Other Structured Finance Applications**

Discussion of readings

General discussion of securitizations

Examples:     Mortgage Backed Securities  
                  Collateralized Debt Obligations  
                  Certificates of Participation  
                  Lease Backed Revenue Bonds

**Readings:**     *Sample Collateralized Debt Obligation Offering Statement*  
                  *Fundamentals, Regulatory and Disclosure Requirements*  
                  *Fabozzi, Chapter 9, Valuation of Mortgage-Backed and Asset-Backed Securities*

## **Class 14 –May 2: Review and Final Thoughts**

Discussion of readings

Review of Course Goals

Reflections on the nature of finance and its impact on global prosperity

Structured finance as a conscious process

Final Thoughts