

Financial Modeling Schedule

| Week | Dates | Topic | Lectures | Projects Assigned | Projects Due |
|---------|-------------|--|---|--------------------------------|--------------------------------|
| Week 1 | 08/31-09/07 | Introduction to the Class, Modeling, Python, and Excel | 1: Financial Modeling with Python and Excel 2: Getting Started with Python and Excel | | |
| Week 2 | 09/07-09/14 | Building a Full Excel Model and Python Basics | 3: The Depth of a Financial Model 4: Going Beyond an Initial Python Script | 1: Excel and Python TVM | |
| Week 3 | 09/14-09/21 | Python Basics, Continued | 4: Going Beyond an Initial Python Script | | |
| Week 4 | 09/21-09/28 | Building a Full Python Model | 5: The Depth of a Financial Model, Continued | | |
| Week 5 | 09/28-10/05 | Visualization | 6: Understanding Complex Results | | |
| Week 6 | 10/05-10/12 | Sensitivity Analysis | 7: Exploring the Parameter Space | | 1: Excel and Python TVM |
| Week 7 | 10/12-10/19 | Sensitivity Analysis and Probability Modeling | 7: Exploring the Parameter Space 8: Probabilistic Modeling | 2: Probabilistic Loan Pricing | |
| Week 8 | 10/19-10/26 | Probability Modeling | 8: Probabilistic Modeling | | |
| Week 9 | 10/26-11/02 | Probability Modeling and Combining Excel and Python | 8: Probabilistic Modeling 9: Combining Excel and Python | | |
| Week 10 | 11/02-11/09 | Monte Carlo Simulation | 10: Monte Carlo Simulation | 3: Monte Carlo Cost of Capital | 2: Probabilistic Loan Pricing |
| Week 11 | 11/09-11/16 | Introduction to DCF Valuation and Cost of Capital Estimation | 11: Introduction to DCF Valuation and Cost of Capital Estimation | | |
| Week 12 | 11/16-11/23 | Free Cash Flow Estimation and Intro to Forecasting | 12: Free Cash Flow Estimation and Forecasting | 4: Full DCF Valuation | |
| Week 13 | 11/23-11/30 | Forecasting Free Cash Flows | 12: Free Cash Flow Estimation and Forecasting | | 3: Monte Carlo Cost of Capital |
| Week 14 | 11/30-12/07 | Advanced Financial Modeling Roadmap | 13: Advanced Financial Modeling | | |
| Week 15 | 12/07-12/17 | Final Project Time | | | 4: Full DCF Valuation |

Week 1 (08/31 - 09/07)

Lectures Covered

- Financial Modeling with Python and Excel
 - About Me
 - Syllabus
 - What is a Financial Model?
 - Tools and Skills
 - Installing Python
- Getting Started with Python and Excel
 - Introduction and an Example Model
 - Building a Simple Excel Model
 - Building a Simple Python Model
 - Basic Iteration
 - Extending a Simple Excel Model
 - Extending a Simple Python Model
 - Getting Started with Python and Excel Labs

Week 2 (09/07 - 09/14)

Lectures Covered

- The Depth of a Financial Model
 - Simple Retirement Model Assumptions
 - Relaxing the Salary Assumption
 - Skills for the Advanced Excel Model
 - Implementing the Dynamic Salary Model
 - Lab Exercise
- Going Beyond an Initial Python Script
 - Structuring a Complex Python Model
 - Branching Logic with Python Conditionals

Projects Assigned

- 1: Excel and Python TVM

Lab Exercises Due by 09/14

- Extending a Simple Retirement Model
- Determining Desired Cash in the Dynamic Salary Retirement Excel Model
- Python Basics - Conditionals

Week 3 (09/14 - 09/21)

Lectures Covered

- Going Beyond an Initial Python Script
 - Grouping Objects with Python Lists
 - Grouping Logic with Python Functions
 - Python Basic Data Types
 - Creating Python Data Types with Classes
 - Handling Errors in Python

Lab Exercises Due by 09/21

- Python Basics - Lists
- Python Basics - Functions
- Python Basics - Data Types
- Python Basics - Classes

Week 4 (09/21 - 09/28)

Lectures Covered

- The Depth of a Financial Model, Continued
 - Using Jupyter to Structure a Python Model
 - Salaries in the Python Dynamic Salary Retirement Model
 - Wealth in the Python Dynamic Salary Retirement Model
 - Retirement in the Python Dynamic Salary Retirement Model
 - Lab Exercise

Lab Exercises Due by 09/28

- Determining Desired Cash in the Dynamic Salary Retirement Python Model

Week 5 (09/28 - 10/05)

Lectures Covered

- Understanding Complex Results
 - Introduction to Visualization
 - Visualization in Excel Example
 - Introduction to Pandas
 - Styling Pandas DataFrames
 - Introduction to Graphs in Python with Pandas
 - Visualization in Python Example
 - Lab Exercises

Lab Exercises Due by 10/05

- Getting Started with Pandas
- Styling Pandas DataFrames
- Introduction to Graphing with Pandas

Week 6 (10/05 - 10/12)

Lectures Covered

- Exploring the Parameter Space
 - Introduction to Parameter Exploration
 - Introduction to Sensitivity Analysis
 - Sensitivity Analysis in Excel
 - Using Python Dictionaries
 - Python List Comprehensions - Convenient List Building
 - Python Imports and Installing Packages

Projects Due by 10/05

- 1: Excel and Python TVM

Lab Exercises Due by 10/12

- Adding Sensitivity Analysis to Project 1 - Excel
- Learning How to Use Dictionaries
- Learning How to Use List Comprehensions

Week 7 (10/12 - 10/19)

Lectures Covered

- Exploring the Parameter Space
 - Introduction to Sensitivity Analysis in Python
 - Sensitivity Analysis in Python Example
 - Lab Exercise - Adding Sensitivity Analysis to Project 1 - Python
- Probabilistic Modeling
 - Introduction to Probabilistic Modeling
 - Math Review for Probabilistic Modeling
 - Introduction to Scenario Analysis
 - Scenario Analysis in Excel
 - Lab Exercise - Adding Scenario Analysis to Project 1 - Excel

Projects Assigned

- 2: Probabilistic Loan Pricing

Lab Exercises Due by 10/19

- Adding Sensitivity Analysis to Project 1 - Python
- Adding Scenario Analysis to Project 1 - Excel

Week 8 (10/19 - 10/26)

Lectures Covered

- Probabilistic Modeling
 - Scenario Analysis in Python
 - Introduction to Internal Randomness
 - Intro to Randomness in Excel
 - Intro to Randomness in Python
 - Lab Exercise - Generating Continuous Random Numbers in Excel and Python
 - Discrete Randomness

Lab Exercises Due by 10/26

- Adding Scenario Analysis to Project 1 - Python
- Generating and Visualizing Random Numbers - Excel
- Generating and Visualizing Random Numbers - Python
- Building a Simple Model of Stock Returns

Week 9 (10/26 - 11/02)

Lectures Covered

- Probabilistic Modeling
 - Adding Internal Randomness to an Excel Model
 - Adding Internal Randomness to a Python Model
 - Internal Randomness Lab Exercises Overview
- Combining Excel and Python
 - Introduction to Combining Excel and Python
 - Combining Excel and Python using Pandas
 - Combining Excel and Python using xlwings

Lab Exercises Due by 11/02

- Extending the Project 1 Model with Internal Randomness
- Reading and Writing to Excel with Pandas
- Reading and Writing to Excel with xlwings

Week 10 (11/02 - 11/09)

Lectures Covered

- Monte Carlo Simulation
 - Introduction to Monte Carlo Simulations
 - Monte Carlo Investment Returns
 - Monte Carlo Dividend Discount Model (DDM) Lab Exercise
 - Formal Introduction to Monte Carlo Simulations
 - Analyzing Relationships with Monte Carlo Simulations
 - Applying Monte Carlo Simulation to a Python Model
 - Applying Monte Carlo Simulation to an Excel Model
 - Relationship of Inputs and Outputs in Excel Monte Carlo Simulation

Projects Assigned

- 3: Monte Carlo Cost of Capital

Projects Due by 11/02

- 2: Probabilistic Loan Pricing

Lab Exercises Due by 11/09

- Monte Carlo Simulation of DDM
- Monte Carlo Simulation of Python Models
- Monte Carlo Simulation of Excel Models

Week 11 (11/09 - 11/16)

Lectures Covered

- Introduction to DCF Valuation and Cost of Capital Estimation
 - Introduction to Discounted Cash Flow (DCF) Valuation
 - Enterprise Value and Equity Value
 - Introduction to Cost of Equity
 - Cost of Equity in Python
 - Cost of Equity in Excel
 - Market Value of Equity
 - Cost of Debt
 - Introduction to Market Value of Debt
 - Calculating the Market Value of Debt in Python
 - Calculating the Weighted Average Cost of Capital (WACC)

Lab Exercises Due by 11/16

- Finding Enterprise and Equity Value Given FCF and WACC
- Finding Cost of Equity Given Historical Prices
- Finding Cost of Debt Given Financial and Market Info

Week 12 (11/16 - 11/23)

Lectures Covered

- Free Cash Flow Estimation and Forecasting
 - Introduction to Free Cash Flows
 - Introduction to Calculating Historical Free Cash Flows
 - Historical Free Cash Flows in Python
 - Introduction to Forecasting
 - Simple Time-Series Forecasting Models
 - Simple Time-Series Forecasting in Excel
 - Simple Time-Series Forecasting in Python
 - Simple Time-Series Forecasting Lab Overview

Projects Assigned

- 4: Full DCF Valuation

Lab Exercises Due by 11/23

- Free Cash Flow Calculation
- Forecasting Simple Time-Series

Week 13 (11/23 - 11/30)

Lectures Covered

- Free Cash Flow Estimation and Forecasting
 - Complex Time-Series Forecasting
 - Complex Time-Series Forecasting in Python - Manual Method
 - Complex Time-Series Forecasting in Python - finstmt Method
 - Complex Time-Series Forecasting Lab Overview
 - Applying Forecasting to Free Cash Flows
 - Calculating a Terminal Value

Projects Due by 11/23

- 3: Monte Carlo Cost of Capital

Lab Exercises Due by 11/30

- Forecasting Complex Time-Series
- DCF Stock Price using Terminal Values

Week 14 (11/30 - 12/07)

Lectures Covered

- Advanced Financial Modeling
 - Introduction to Advanced Financial Modeling
 - Additional Types of Financial Models
 - Data Pipelines for Financial Modeling
 - Advanced Mathematical Tools for Financial Modeling
 - Better Presentation of Python Financial Models
 - Programming Skills for Advanced Financial Models
 - Extra Resources for Python Financial Modeling

Week 15 (12/07 - 12/17)

Projects Due by 12/17

- 4: Full DCF Valuation