**FORDHAM UNIVERSITY**

**Master of Science in Global Finance**

**Computational Finance**

**GFGB-7039, AIGB-7240**

**11AM-1PM, 3.30PM-5.30PM, 5.45PM-7.45PM**

Professors:

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**SYNOPSIS:**

This course is an introduction to data analysis in finance. The first half of the course will review programming in Python. We will take the opportunity to learn programming concepts that are useful in financial analysis. As part of the learning process, you will retrieve and collate data from various sources. We will examine the key identifiers used in practice for financial data analytics using data on various financial assets. Emphasis is placed on accessing financial data from various sources, working with pandas, and applying Data Science methods to conduct practical financial modeling and research. The course will include homework activities and a final extensive research project. The weekly activities and their timely submission are essential to master the skills in this course.

**Syllabus Disclaimer:**

We reserve to modify this syllabus. Any modifications will be communicated to you through our Blackboard.

**Recommended TEXT:**

McKinney, W. (2017). *Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython* (*2nd ed.)* O’Reilly Media, Inc.

**Course requirements and grading:** students are required to attend class, make presentations, submit weekly activity, complete a test and a final project. Class presentation and the project are team-work activities. Your team members are available on your course Blackboard. Blackboard allows you to communicate and collaborate with your team members. Weekly activities are submitted individually. Late submission is not accepted because the solution of these activities will be reviewed in class at the submission due date. Out of the 10 activities the worst grade will not included in the activities average performance. The following describes the determinants of your final score.

|  |  |
| --- | --- |
| **Requirement** | **weight** |
| Homework Activities | 40% |
| Test | 30% |
| Final project including project presentation | 30% |
| Total | 100% |

**ACTIVITY GRADING**

* We have designed several assignments called “Activities” for the course.
* Activities are time intensive, so please do not wait till the due date to attempt them
* Each activity is structured as a set of multiple choice questions on Blackboard.
* *Activities that are not submitted by the Due Date will be assigned a score of zero*
* Each activity allows two submissions – so please submit at least one attempt a day or two before the due date.
* You have to get at least 80% of the max score to get full points for an activity. This will be implemented by multiplying the Activity score by 1.2, subject to a cap equal to the max score
* There will be one optional make-up activity. If you choose to attempt the make-up activity, we will replace a low score on an activity with the make-up activity score.
* THERE ARE NO EXTRA CREDITS or DUE DATE WAIVERS.
* Two attempts are given to help you manage the due date. The last version uploaded will be graded. No preliminary grades will be assigned after the 1st submission.

**Class Schedule:**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Day** | **Date** | **Topics** |  | |  | |  | |  | |
| THURSDAY | 8/28/2025 | variables, objects and types | | | |  | |  | |
|  |  | Lists |  | |  | |  | |  | |
|  |  | Functions -- some available functions in Python | | | | | |  | |
|  |  | Packages |  | |  | |  | |  | |
|  |  | Arrays |  | |  | |  | |  | |
|  |  |  |  | |  | |  | |  | |
| THURSDAY | 9/4/25 | Numpy Statistics | |  | |  | |  | |
|  |  | Data Visualization | |  | |  | |  | |
|  |  | Dictionaries |  | |  | |  | |  | |
|  |  | Pandas and DataFrames | |  | |  | |  | |
|  |  | merging DataFrames | |  | |  | |  | |
|  |  | Concatenating DataFrames | | | |  | |  | |
|  |  |  |  | |  | |  | |  | |
| THURSDAY | 9/11/25 | Comparison Operators | |  | |  | |  | |
|  |  | Control Flow |  | |  | |  | |  | |
|  |  | Filtering Data Frames | |  | |  | |  | |
|  |  | Loops |  | |  | |  | |  | |
|  |  | Random Numbers | |  | |  | |  | |
|  |  | Valueing a call option using simulation | | | |  | |  | |
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| THURSDAY | 9/18/25 | Data manipulation using Data Frames | | | |  | |  | |
|  |  | sorting |  | |  | |  | |  | |
|  |  | subsetting |  | |  | |  | |  | |
|  |  | Data Exploration | |  | |  | |  | |
|  |  | Counting |  | |  | |  | |  | |
|  |  | Pivot tables | |  | |  | |  | |
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| THURSDAY | 9/25/25 | Working with Date and Time | | | |  | |  | |
|  |  | Working with Dates -- ISO format | | | |  | |  | |
|  |  | Bringing time | |  | |  | |  | |
|  |  | Creating and stripping Datetime variables | | | | | |  | |
|  |  | Pandas Datetime capabilities | | | |  | |  | |
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|  |  | **ACTIVITY 1 and 2 Due** |  | |  | |  | |  | |
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| THURSDAY | 10/2/25 | User defined functions | |  | |  | |  | |
|  |  | define functions without parameters, | | | |  | |  | |
|  |  | define functions with single parameters, | | | | | |  | |
|  |  | define functions that return a single value | | | | | |  | |
|  |  | multiple arguments to functions | | | |  | |  | |
|  |  | examples |  | |  | |  | |  | |
|  |  | **ACTIVITY 3 and 4 DUE** |  | |  | |  | |  | |
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| THURSDAY | 10/09/24 | Applications |  | |  | |  | |  | |
|  |  | Stock Valuation | |  | |  | |  | |
|  |  | portfolio analysis | |  | |  | |  | |
|  |  | options |  | |  | |  | |  | |
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| THURSDAY | 10/17/24 | TEST – TBA  **ACTIVITY 5 and 6 DUE** |  | |  | |  | |  | |
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| THURSDAY | 10/23/24 | The yfinance library | |  | |  | |  | |
|  |  | download method | |  | |  | |  | |
|  |  | ticker method | |  | |  | |  | |
|  |  | info method to extract stock information | | | |  | |  | |
|  |  | using a loop to extract information on multiple symbols | | | | | | | |
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| THURSDAY | 10/30/25 | Introducing and working with yahoo\_fin package | | | | | |  | |
|  |  | get\_data method | |  | |  | |  | |
|  |  | obtain and work withrussell 1000 symbols | | | | | |  | |
|  |  | stock profile for Random sample from russell 1000 | | | | | |  | |
|  |  | use a loop to extract specific information from yahoo finance | | | | | | | |
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| THURSDAY | 11/0625 | Web-scraping libraries like requests.  Use it to get financial and economic data.  Use Finvis to download Fundamental data | | | |  | |  | |
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| THURSDAY | 11/13/25 | Review of Statistical inference in Python  Regression and using Statsmodels API | | | | | |  | |
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| THURSDAY | 11/20/25 | Research Methodologies and project help  Assessing the importance of headlines sentiment analysis | |  | |  | |  | |
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| THURSDAY | 11/27/24 | THANKSGIVING – NO CLASS | | | | | |  | |
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| THURSDAY | 12/04/25 | PROJECT PRESENTATIONS | |  | |  | |  | |
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| THURSDAY | 12/11/25 | PROJECT PRESENTATIONS | |  | |  | |  | |

**ACTIVITY DUE DATES: Please Check on Blackboard**