

**Sabancı Business Analytics for Professionals (Non-Thesis) Program
Fall 2022-23****BAN 835 – Computational Tools and IT for Analytics**

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Type	Time	Days	Where
Class	19:00-22.00	Thursdays	Altunizade Campus
Class	13:30-16:30	Saturdays	Altunizade Campus

Course Objective:

This course teaches the fundamental ideas to clean, manipulate, process and analyze data. Following a detailed review of programming fundamentals and Python language basics, the students will work on data analysis problems arising in various data-intensive applications. The course involves many in-class coding exercises where the students are expected to work on several case studies. Through these exercises, the course shall also serve as an introduction to data analytics and modern scientific computing with Python programming language.

Learning Outcomes:

Upon successful completion of the course, the student should be able to:

1. Understand the fundamentals of writing Python scripts
2. Learn core Python scripting elements such as variables and flow control structures
3. Discover how to work with lists and sequence data
4. Write Python functions to facilitate code reuse
5. Use Python to read and write files
6. Use Python tools to analyze and process data

Course Material:

All resources listed below are optional. Required reading materials will be provided by the instructor on weekly basis from the list below.

- Textbook: Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython *2nd Edition*, Wes McKinney, O'Reilly, 2018

- Python official online documentation: <https://www.python.org/doc/>

Cases and Classwork

At least 5 cases will be assigned at class hours, each week. Throughout the class time you'll be able to ask questions about the case. Following the class time students will submit their solutions to SuCourse.

Course Web:

- All content will be shared on SuCourse
- All assignments and exams will be announced and submitted on SuCourse
- Please check SuCourse on weekly basis for announcements related with the course.
- All submissions will be checked for plagiarism with Turnitin software. Sabanci University uses a very powerful web-based tool called Turnitin. Turnitin is the worldwide standard in online plagiarism prevention. It allows instructors to compare student papers against a database composed of millions of articles. Every paper you submit will be scanned by Turnitin, and results will be reflected in your grades.

Instructional Design:

Classes will be handled synchronously. For each major subject an assignment will be submitted.

Grading:

Cases	: 50%
Midterm Exam	: 25%
Final Exam	: 25%

Requirements:

Cases: Cases will be assigned in class time, students will have opportunity to discuss the possible solutions with the instructor. Not completed cases will have to be submitted no later than 1 week time.

Midterm / Final Exam: Coverage will be further announced. Both of the exams will contain a theory and a coding section. Regarding the theory section, students will answer questions related with the topics covers. For the coding section, one or two problems will be requested to be solved using Python language.

Academic Honesty:

Learning is enhanced through cooperation and as such you are encouraged to work in groups, ask for and give help freely in all appropriate settings. At the same time, as a matter of personal integrity, you should only represent your own work as yours. Any work that is submitted to be evaluated in this class should be an original piece of writing, presenting your ideas in your own words. Everything you borrow from books, articles, or web sites (including those in the syllabus) should be properly cited. Although you are encouraged to discuss your ideas with others (including your friends in the class), it is important that you do not share your writing (slides, MS Excel files, reports, etc.) with anyone. Using ideas, text and other intellectual property developed by someone else while claiming it is your original work is *plagiarism*. Copying from others or providing answers or information, written or oral, to others is *cheating*. Unauthorized help from another person or having someone else write one's paper or assignment is *collusion*. Cheating, plagiarism and collusion are serious offenses that could result in an F grade and disciplinary action. Please pay utmost attention to avoid such accusations.

Classroom policies and conduct

Sabancı Business Analytics for Professionals (Non-Thesis) Program values participatory learning. Establishing the necessary social order for a participatory learning environment requires that we all:

- Come prepared to make helpful comments and ask questions that facilitate your own understanding and that of your classmates. This requires that you complete the assigned readings for each session before class starts.
- Listen to the person who has the floor.
- Come to class on time.
- Students can use their laptops to follow up the coding examples. For laptops online access and permission to use Google Apps must be enabled.

Course Schedule:

Week 1	Date: September 29 th – October 1 th
	Topic: Introduction to Python, Decision Making
	Requirements: Case 1
Week 2	Date: October 6 th – 8 th
	Topic: Sequences and String Type
	Requirements: Case 2
Week 3	Date: October 13 th – 15 th
	Topic: Plotting, Loops, User Defined Functions
	Requirements: Case 3
Week 4	Date: October 20 th – 22 nd
	Topic: Methods, Data Structures, Objects, File IO
	Requirements: Case 4
Week 5	Date: October 27 th
	Topic: -
	Requirements: Midterm Exam
	No Class on October 29th

Week 6	Date: November 3 rd – 5 th
	Topic: Data Analysis and Statistical Applications: Numpy & Pandas
	Requirements: Case 5
Week 7	Date: November 10 th – 12 th
	Topic: Linear Regression and Logistic Regression
	Requirements: -
Finals Week	Date: November 19 th
	Requirements: Final Exam

Projected Outline:

- Introduction to Python and Google Colab
 - Syntax, variables, operators
 - Input / Output
 - Basic Calculations
- Decision Making
 - Control Statements
- Sequences
 - String
 - List
 - Range
 - Basic Plotting with Matplotlib
- Loops
 - For
 - While
 - Combining loops with control statements
- User Defined Functions and Methods
- Basic Data Structures
 - Dictionary
 - Set
- File I/O
- Numerical operations with Numpy
- Data analysis with Pandas
- An Application of Statistical Analysis with StatModels
- Analytical Plotting with Matplotlib and Seaborn
- What about Big Data?
- Linear Regression – An Application of Statistical Learning with StatModels and Scikit Learn
- Logistic Regression - An Application of Statistical Learning with StatModels and Scikit Learn