



**PLANO DE ENSINO – 2023/1**

IDENTIFICAÇÃO DA DISCIPLINA:				
CÓDIGO	NOME DA DISCIPLINA	TURMA	Nº DE HORAS-AULA SEMANAIS	TOTAL DE HORAS-AULA SEMESTRAIS
EQA5428	Tópicos Especiais em Química e Engenharia de Alimentos: Introduction to Python for Research	07215	04	54

PROFESSOR(ES) MINISTRANTE(S)	HORÁRIO DE ATENDIMENTO
Sergio Yesid Gómez Gonzalez (sergio.gomez@ufsc.br)	Segunda 8-12 : Sala E-301 - EQA

PRÉ-REQUISITO(S)	
CÓDIGO	NOME DA DISCIPLINA
EQA5415 <i>eh</i>	Fenômenos de Transferência I <i>eh</i>
INE5202 <i>eh</i>	Cálculo Numérico em Computadores <i>eh</i>
MTM5164	Cálculo D

EQUIVALENTES
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CURSO(S) PARA O(S) QUAL(IS) A DISCIPLINA É OFERECIDA
ENGENHARIA QUÍMICA
ENGENHARIA DE ALIMENTOS

Syllabus
Python Basics, Objects and Methods, Manipulating Objects, Numpy, Symbolic Mathematics, Thermo, Data Visualization-Manipulation, Statistics.  This course considers the Early Assessment Examination (EAA) in the Graduate Program in Chemical Engineering (PosENQ) at UFSC in agreement with the Normative Resolution nº 01/2021.

Objectives
At the end of the course, the student should be able to use Python as a code programming language and identify-use the basic structures such as math operations, conditionals, booleans, loops, and arrays. It is also expected that the students become familiar with the use of standard scientific Python environment (Numpy and Scipy), symbolic mathematics (SymPy), development and visualization of graphs (Matplotlib, VPython), and using simple and efficient tools to store, manipulate and generate data and analysis (Pandas, Thermo, Scikit-learn). Students are also expected to develop the ability to apply the foundations of the discipline to their research problems.

Program Content
Understand the concepts of basic operations, operations using booleans, and application of conditionals, and loops under the computer programming language Python.



Use of standard scientific Python environment and other useful packages; Numpy-Scipy, Thermo, and SymPy).  
Development and visualization of data and graphs in Python using Matplotlib and VPython.  
Store and manipulate data using Pandas.  
Introduction to predicting data analysis using Scikit-learn.  
Applied Case Study.

### Teaching Methodology

The classes will present the general idea and relevant discussions of the context of each topic, developing the material using the blackboard and additional resources such as slides, computing software, including:

- Explanation and software implementation of the content involving problems with applications.
- Exercise-solutions drills to fix the content and of discussions related to the topics covered.
- Case study.

### IX. Assessment Methodology

The final grade will be composed by the following elements:

- Assignments (70%)
- Case Study (30%)

The application of the Early Assessment Examination will be offered (a single test), according to Normative Resolution PósENQ 01/2021, considering all topics of the Course. The assessment grade will replace the other assessments and will be applied in the first week of class, at a time to be defined after the first class.

### X. Syllabus

Lecture	Content
1 03/03 4h	Introduction to the Course
2 10/03 4h	Operations, Booleans, Conditionals, and Loops
3 17/03 4h	Scipy - Numpy
4 24/03 4h	Sympy - Thermo
5 31/03 4h	Matplotlib
- 07/04 4h	Good Friday
6	VPython



14/04 4h	
- 28/04 4h	Tiradentes Day
7 28/04 4h	Pandas
8 05/05 4h	Scikit-learn
9 12/05 4h	Case Study
10 19/05 4h	Term-end

#### **XI. Bibliography**

Open Access Options and Material available in the Moodle system  
Online books at BU/UFSC: <http://portal.bu.ufsc.br/a-biblioteca-universitaria-daufsc-oferece-acesso-a-livros-eletronicos-em-diversas-areas-do-conhecimento/>

#### **IX. Additional Bibliography**

- Hans Petter Langtangen, A Primer on Scientific Programming with Python, 5<sup>th</sup> Edition, Springer, 2016.
- John Hunt, A Beginners Guide to Python 3 Programming, 1<sup>st</sup> Edition, Springer, 2019
- Rubin H. Landau, Manuel J. Páez and Cristian C. Bordeianu, Computational Physics, 3<sup>d</sup> Edition, Wiley-VCH, 2015

Assinatura do Professor

Assinatura do Chefe do  
Departamento