

PROGRAMMING WITH PYTHON

Bachelor course (ECTS: 6)

Course leaders:

TOMAT Luka, University of Ljubljana, School of Economics and Business, Slovenia

Since 2017 Luka Tomat is a regular member of Academic Unit for Business Informatics and Logistics at the University of Ljubljana, School of Economics and Business. He teaches several information management related courses and labs in both, Slovene and English. In his research he is focusing on research with respect to Information management, optimization, electronic business, business process management, big data analytics, IT in tourism and IT in healthcare. He also participates at several commercial projects.

NARTNIK Tina, University of Ljubljana, School of Economics and Business, Slovenia

Tina Academic is a teaching assistant and a regular member of Academic Unit for Business Informatics and Logistics at the University of Ljubljana, School of Economics and Business.

Aims of the course:

The course is designed to introduce students to the fundamental concepts and techniques of software development using the Python programming language. The course emphasizes practical skills alongside theoretical understanding, enabling students to develop, analyze, and understand simple Python programs. Key focus include basic Python syntax, effective use of variables, functions, control structures like loops and decisions, and managing lists and dictionaries. Furthermore, the course will make an introduction to data analytics with Python delving into tools and libraries for data analysis, data structures basics and exploratory data analysis. The course will provide a well-rounded skill set, preparing students for real-world programming challenges. By the end of the course, students are expected to have a solid grasp of Python programming and be able to create basic software applications.

Prerequisites:

No prerequisites needed. The course will start from scratch, thus prior knowledge of programming is not required. However, all lectures will be held in computer classroom including all the necessary software, but feel free to bring your own laptops and use them during lectures.

Course content:

DATE	DAILY TOPIC/SESSION
Monday, 8 July	Course introduction (1h): Welcome to Python <ul style="list-style-type: none"> • Short intro to python, why program? • Hardware overview • Python as a language • Elements of Python
Tuesday, 9 July	Lectures (3h): Variables, Expressions and Conditional code <ul style="list-style-type: none"> • Constants, variables, name rules, mnemonic, assignment statements, expressions (numeric), order of evaluation, operators, types, conversions, integers, user inputs, commenting • Comparison operators, indentation, one-way decisions, two-way decisions (if, else), nested decisions, multiway decisions (elif), try/except • Practical work
Wednesday, 10 July	Lectures (3h): Functions <ul style="list-style-type: none"> • Why use functions? • Functions, built-in functions, type conversations (int, float), string conversations, parameters • Arguments, results (fruitful functions), void (non-fruitful) functions • Practical work
Thursday, 11 July	Lectures (3h): Loops and Iterations <ul style="list-style-type: none"> • Indefinite loops, infinite loops, break, continue, none constants and variables, for loops (definite), iteration variables, loop idioms • Looping through set, largest, smallest, counting, summing, average, filtering, is and is not • Practical work
Friday, 12 July	Lectures (3h): Strings, Files and Lists <ul style="list-style-type: none"> • String data type, reading and converting, looking inside strings, looping through strings, counting, slicing, concatenation, comparison, library, search & replace, prefixes • Opening a file, handle, reading and searching through file, • Lists and list constants, lists and definite loops, mutability, methods, building a list, order, built-in functions • Practical work
Monday, 15 July	Lectures (3h): Dictionaries and Tuples <ul style="list-style-type: none"> • Dictionaries, comparing lists and dictionaries, dictionary literals, tracebacks, get method, counting, definite loops, retrieving list of keys and values • Tuples, assignment, sorting • Practical work
Tuesday, 16 July	Lectures (3h): Introduction to Data Analytics <ul style="list-style-type: none"> • The why, what, and how • Data & tools • Working with tables • Use Cases • Practical work

Wednesday, 17 July	Lectures (3h): Coding in Jupyter <ul style="list-style-type: none"> • Intro to Jupyter Notebooks • Importing the data • Libraries (NumPy, Matplotlib, Pandas, Seaborn...) • Dataframes • Practical work
Thursday, 18 July	Lectures (3h): Data Wrangling <ul style="list-style-type: none"> • Working with Dataframes • Working with Data types • Data manipulation and Joining data • Filtering and Calculations • Intro to Visualization • Practical work
Friday, 19 July	<i>No lectures (day off)</i>
Monday, 22 July	Lectures (3h): Exploratory Data Analysis basics <ul style="list-style-type: none"> • Data cleaning • Data visualization • Understanding the relationships • Identifying Patterns and Anomalies • Practical work
Tuesday, 23 July	Lectures + Preparation for final examination (3h) <ul style="list-style-type: none"> • Python Use Cases for Data Analytics • Chain dependencies • Projects preparation
Wednesday, 24 July	<i>Projects presentations</i>

◆ Course materials / List of readings:

- Course materials published on the course website (slides, scripts, files, quizzes...)
- Severance, C (2016) - Python for Everybody: Exploring Data in Python 3: http://do1.dr-chuck.com/pythonlearn/EN_us/pythonlearn.pdf

Additional readings:

- Bonaretti, S (2023) - Learn Python with Jupyter: https://www.learnpythonwithjupyter.com/assets/book/learn_python_with_jupyter.pdf

◆ Teaching and examination methods:

- Project: 80%
- In class group work: 20%

Grading scale:

DEFINITION	%	LOCAL SCALE	ECTS SCALE	Grade (USA)
exceptional knowledge without or with negligible faults	92-100	10	A	A+, A, A-
very good knowledge with some minor faults	85-91	9	B	B+, B
good knowledge with certain faults	77-84	8	C	B
solid knowledge but with several faults	68-76	7	D	C+, C, C-
knowledge only meets minimal criteria	60-67	6	E	D+, D
knowledge does not meet minimal criteria	<60	5	F	