VIDZEME UNIVERSITY
OF APPLIED SCIENCES

FACULTY OF ENGINEERING
STUDY COURSE DESCRIPTION

Course Title:	**INTRODUCTION TO PYTHON and DATA EXPLORATION**
Course code (VAIS):	
Study programme:	**Information technologies**
Level of Study programme:	☐ 1st level professional higher education ☒ Professional Bachelor ☐ Professional Master ☐ PhD level
Type of Study programme:	☐ Compulsory course (Part A) ☐ Professional specialization courses (Part B, compulsory) ☒ Professional specialization optional courses (Part B, optional) ☐ Elective courses (Part C)

Course Workload:	**Credits**	**ECTS**	**Academic hours**	**Contact hours**	**Independent work hours**
	2	3	80	32	48

Course Author/ Tutor:	**Kaspars Osis** Assoc. Prof., Dr.sc.ing. kaspars.osis@va.lv Consultation: according to the schedule for each semester or per individual agreement.
Course Form:	Full time
Study year, semester:	Year 1, Semester 1
Language:	Latvian, English
Prerequisites for the Course:	None.
Course Summary:	The aim of this course is to provide concise overview of programming area, theoretical and practical knowledge about programming basics including data types, control structures, algorithm development and usage of functions by focusing on Python programming language. Python is designed to emphasize code readability. Even though Python is easy for beginners to learn, it is widely used in many scientific areas for data exploration. By performing practical assignments students will have an opportunity to gain and improve their practical skills in area of Python solutions development and data exploration. The work within the course is done in small groups.
Course Methods:	Lectures, practical activities, group work, theory tests, final assessment (project work assignment) etc.
Assessment:	Examination (project work assignment)
Requirements for Credits:	1. Successful completion of workshops/practical work assignments (at least 60% points of totally available). 2. Passed theoretical tests. 3. Successful completion of project work assignment (at least 65% points of totally available). Final assessment consists of: workshops/practical work assignments, group work evaluations; theoretical tests; project work assignment and project work assignment presentation.

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All practical work assignments have to be accepted (i.e. at least with 60% evaluation) in order to get the final evaluation within this course. 250 points system is used to come up with final evaluation. Table below lists totally available points for each activity.

Work assignment or activity	Points
Practical work assignments	90
Theoretical tests	30
Participation in class work activities	15
Project work assignment (exam)	100
Project work assignment presentation (exam)	15
Total	**250**

Final course evaluation (mark) calculation based on 250 points system is done as it follows below:

>= 93% (232-points) = 10   >= 79% (197- points) = 6
>= 90% (225- points) = 9   >= 72% (180- points) = 5
>= 87% (217- points) = 8   >= 65% (162- points) = 4
>= 83% (207- points) = 7   <   65% (162- points) = 3

Missing practical work assignment deadline: each missed day counts for subtraction of 5% from totally available points. It is required to acquire at least 60% from totally available points (not counting potential delay) in order to accept practical work assignment as done.

Abiding by the Academic Ethics

Students must abide by the academic and research ethics, Vidzeme University of Applied Sciences Ethics Regulations, incl.:
– study papers must be independently developed;
– the study work should reference all statements, ideas and data used that have been authored by someone else;
– appropriate data acquisition methods should be used in the acquisition of data, the research ethics must be respected, empirical data must be collected independently and cannot be distorted or falsified;
– the examination must be carried out by the student independently, without the use of supporting materials and/or consultations with other students, unless the lecturer states otherwise.
In the event of non-compliance with the academic and research ethics, punishment is imposed in accordance with the ViA Ethics Regulations and the study course must be re-taken, unless the punishment is extramarital.

Course Contents:

Introduction in course and programming.
Introduction in Python, environment and basics.
Development of first application.
Variables, expressions and statements.
Conditional execution.
Functions and usage.
Loops and iterations.
String data type, usage, operations.
Work with files.
Regular expressions.
Data structures – lists, dictionaries, tuples.
Introduction to network, protocols. Characters and strings, their types.
Web scraping.
Introduction to web services.
Python objects and SQLite.

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	Learning Outcomes	The evaluation methods and criteria
Learning Outcomes; the evaluation methods and criteria	**Knowledge**	
	Knowledge on programming, its actuality, usage, and in particular about Python environment and basics.	Development of particular programming solution concept. Passed theoretical test.
	Knowledge on Python solutions types and data persistence options.	Development of particular programming solution concept. Passed theoretical test.
	Knowledge regarding network based data acquisition, its types and application areas.	Development of particular programming solution concept. Passed theoretical test.
	Skills	
	To develop Python solution with beginning complexity.	Developed practical group work.
	To develop Python solution using file and SQLite functionality.	Developed practical group work.
	To develop Python solution using several types of data structures for data acquisition, storage and processing.	Developed practical group work.
	Competency	
	Able to use correct Python solutions terminology and to choose appropriate technological approaches for particular assignment implementation.	Course project development and presentation.
	Able independently to perform Python solutions development initial design and architecture.	Course project development and presentation.
	Able to solve Python solutions basic issues, to perform testing and debugging activities.	Course project development and presentation.

Course Compulsory literature:	1. K. A. Lambert. Fundamentals of Python: First Programs 2nd edition, Cengage Learning Custom Publishing, 2017. 2. Ch. Severance. Python for Everybody: Exploring Data in Python 3, Createspace Independent Publishing Platform, 2016.
Course additional literature:	1. W. McKinney. Python for Data Analysis, 2e: Data Wrangling with Pandas, NumPy, and IPython 2nd edition, O'Reilly Media, Inc., 2017.
Course confirmation date:	
Date of course description update:	

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Study Course Plan:

Date	Theme	Academic hours		Study Form
		Contact hours	Independent work hours	
The date is specified before the implementation of the course	Introduction in course and programming. Introduction in Python, environment and basics. Development of first application.	4	2	Theoretical lecture. Several topics covering practical work. Group work.
	Variables, expressions and statements. Conditional execution.	4	4	Theoretical lecture. Several topics covering practical work. Group work
	Functions and usage. Loops and iterations.	4	4	Theoretical lecture. Several topics covering practical work. Group work
	String data type, usage, operations. Work with files. Regular expressions.	4	5	Theoretical lecture. Several topics covering practical work. Group work
	Data structures – lists, dictionaries, tuples.	4	5	Theoretical lecture. Several topics covering practical work. Group work
	Introduction to network, protocols. Characters and strings, their types. Web scraping. Introduction to web services.	4	5	Theoretical lecture. Several topics covering practical work. Group work
	Python objects and SQLite.	4	5	Theoretical lecture. Several topics covering practical work. Group work
	Final examination	4	18	Course project development and presentation.
	Hours total:	*32*	*48*	

Note: lecturer keeps the rights to make changes in the course plan.