Course Name : Advanced Program in Python

Course Code	Course Type	Regular Semester	Lecture (hours/week)	Seminar (hours/week)	Lab. (hours/week)	Credits	ECTS
CMP 404	B	Spring	3.00	1.00	0.00	3.50	6.00

Lecturer	Migena Ceyhan, PhD
Assistant	Sadije Bushati, Prof. Dr
Course language	Albanian
Course level	Master
Description	The course "Advanced Program in Python" aims to reinforce and deepen students' knowledge of advanced Python usage, including topics like advanced data structures, higher-order functions, decorators, error handling, concurrency, and modern application development.
Objectives	To apply advanced programming concepts in Python. To utilize modern data structures and functional techniques. To develop complex and scalable applications using Python. To use tools and techniques for handling parallel and asynchronous processing.
Core Concepts	Advanced data structures (set, dict, deque, namedtuple) Higher-order functions and lambdas Decorators and generators Error handling and testing Parallel and asynchronous processing Packages, modules, and virtual environments API programming and networking

Course Outline

Week	Topic
1	Review of Python Basics
2	Advanced Data Structures
3	Higher-order Functions and Lambdas
4	Decorators and Generators
5	Error Handling and Context Managers
6	Objects, Classes, and Metaclasses in Python
7	Testing and Refactoring
8	Midterm Exam
9	Parallel Processing: Threading and Multiprocessing
10	Asynchronous Programming with asyncio
11	Packages and Virtual Environments
12	API Communication and JSON Handling
13	Web Scraping and Data Analysis
14	Mini Project: API or CLI Application
15	Project Presentation / Final Review
16	Final Exam

Prerequisites	The student must attend the course at a minimum rate of 75%.
Literature	• Luciano Ramalho – Fluent Python: Clear, Concise, and Effective Programming, 2nd Edition, O'Reilly Media, 2022.
References	• Mark Lutz – Learning Python, 5th Edition, O'Reilly Media, 2013. • David Beazley – Python Cookbook, 3rd Edition, O'Reilly Media, 2013. • Brett Slatkin – Effective Python: 90 Specific Ways to Write Better Python, 2nd Edition, Addison-Wesley, 2019.

Course Outcome

1	Students will be able to use advanced Python skills to build real-world applications.
2	They will understand and apply functional and object-oriented patterns in Python.
3	They will use efficient data structures and parallel/asynchronous techniques.
4	They will be capable of building APIs and communicating with external services.

Course Evaluation

In-term Studies	Quantity	Percentage
Midterms	1	35
Quizzes	0	0
Projects	0	0
Term Projects	0	0
Laboratory	0	0
Class Participation	0	0
Total in-term evaluation percent		**35**
Final exam percent		**65**
Total		**100**

ECTS Workload (Based on Student Workload)

Activities	Quantity	Duration (hours)	Total (hours)
Course duration (Including the exam week: 16x Total hours of the course)	16	4	64
Study hours outside the classroom (Preparation, Practice, etc.)	14	3	42
Duties	0	0	0
Midterms	1	10	10
Final Exam	1	20	20
Other	1	14	14
Total Work Load			**150**
Total Work Load / 25 (hours)			**6.00**
ECTS			**6.00**