

CIVIL-127

Programming and software development for engineers

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Cursus	Sem.	Type
Civil Engineering	BA2	Obl.

Language of teaching	English
Coefficient	3
Session	Summer
Semester	Spring
Exam	During the semester
Workload	90h
Weeks	14
Hours	3 weekly
Courses	1 weekly
TP	2 weekly
Number of positions	

Summary

Python programming course to advance students' existing programming skills and help write better software. The course will teach best practices and techniques such as refactoring, debugging, and unit testing.

Content

Review major Python features (any feature available in 3.12.x is in scope), such as:

- Basic data types (str, int, float, bool, list, tuple, sets, dictionaries)
- Loops
- Control flow
- Classes
- Common libraries
- Tooling (IDE, linters, type checkers, etc.)
- Writing testable code
- Unittesting
- Integration testing
- Dependency Injection
- Code coverage

Debugging techniques

Selected topics in the field of software design

- Common patterns
- Common pitfalls

Using git to manage a codebase

- Basic commands in a CLI.
- Splitting large commits into smaller chunks

Technical writing

- Writing technical documents
- Writing effective comments
- Writing effective error messages

Keywords

Python, software development

Learning Prerequisites

Required courses

Basic knowledge of python

Learning Outcomes

By the end of the course, the student must be able to:

- Apply industry-standard best practices in Python programming.
- Develop clean, testable, and easily reviewable code.
- Assess / Evaluate existing codebases to improve code quality and functionality.
- Test Test, debug, and fix bugs in a systematic and efficient manner.
- Implement new features in existing large-scale software projects.

Transversal skills

- Evaluate one's own performance in the team, receive and respond appropriately to feedback.
- Respect relevant legal guidelines and ethical codes for the profession.

Teaching methods

Class in-person lectures + labs

Expected student activities

Attend class lectures, labs, complete weekly programming assignments and projects.

Assessment methods

MCQ exam + graded programming assignments+project

Supervision

Office hours	No
Assistant.e.s	Yes
Forum	Yes

Resources

Virtual desktop infrastructure (VDI)

No

Moodle Link

- <https://go.epfl.ch/CIVIL-127>