

# PIA2602: COMPUTATIONAL LANGUAGE COURSE II

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## Effective Term

Semester B 2025/26

## Part I Course Overview

### Course Title

Computational Language Course II

### Subject Code

PIA - Public and International Affairs

### Course Number

2602

### Academic Unit

Public and International Affairs (PIA)

### College/School

College of Liberal Arts and Social Sciences (CH)

### Course Duration

One Semester

### Credit Units

3

### Level

B1, B2, B3, B4 - Bachelor's Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

PIA2601

### Precursors

Nil

### Equivalent Courses

Nil

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

Based on PIA2601, this course is designed to provide future public sector practitioners with advanced skills of Python. It covers:

- 1) advanced operations of Python,
- 2) data analytics with Python for public sector needs,
- 3) dealing with big data by Python, especially in the public context,
- 4) a basic understanding of other applications such as automation, web and APP development.

Students are not required to become programmers, but they will have the opportunity to grasp the language and thinking patterns used by programmers and data specialists. In this way, students are equipped as future managers, administrators, or public policymakers who are capable to employ basic programming tools to fulfil job responsibilities and support decision-makings, as well as communicate and collaborate smoothly and effectively with tech-parties. Consistent with PIA2601, educational tools like AI, metaverse, online video and workshop sessions with guidance from the lecturer and teaching assistants will be provided.

### Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Grasp some advanced operations of Python	20%	x	x	x
2	Develop skills for data analytics with Python for public sector needs	30%	x	x	x
3	Deal with big data with Python, especially in the public context	20%	x	x	x
4	Gain a basic understanding of other applications of Python such as automation, web and APP development	10%		x	
5	Distinguish the social and ethical issues in the use of public data	10%	x		
6	Improve the logical thinking ability, problem-solving ability, teamwork ability, and lifelong learning ability in the process of learning programming	10%	x		

#### A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

#### A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

#### A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

### Learning and Teaching Activities (LTAs)

LTAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture and workshops	Introduce key theories and approaches in Python, data analytics and other applications. In workshops, students will do hands-on to apply Python skills under the teaching assistants and lecturer's guidance.	1, 2, 3, 4, 5, 6	
2	Virtual teaching and learning	Students are encouraged to 1) watch pre-recorded instructional videos by teachers before and after class to deepen their understanding of the concepts; 2) try to use internet resources, AI tools and meta-universe tools in class and after class to promote the learning and application of programming; 3) document and reflect on these processes using innovative means to prepare for sustaining lifelong learning in the information age.	1, 2, 3, 4, 5, 6	
3	Team project	Small teams of students to work together to develop a comprehensive solution to a public sector problem using Python.	1, 2, 3, 5, 6	

**Assessment Tasks / Activities (ATs)**

ATs		CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Performance in lecture and workshops, such as: - Punctuality - Engagement and responsiveness - Hands-on and exercises in class - Quizzes	1, 2, 3, 4, 5, 6	20	-	Yes

2	Assignment: a number of take-home exercises	1, 2, 3, 5, 6	30	In this part, students are allowed to use AI and other online and virtual tools to help them improve the quality of their work, but are required to honestly record the process of using these tools and actively engage in self-reflection, and report these records in writing to the lecturer (this report will also be required to submit as an integral part of the assignment).	Yes
3	Test: In the last week of class, there will be a one-hour closed-book test on the concepts covered in the course.	1, 2, 3, 4, 5	20	-	No
4	Team project and presentation	1, 2, 3, 5, 6	30	In this part, students are allowed to use AI and other online and virtual tools to help them improve the quality of their work, but are required to honestly record the process of using these tools and actively engage in self-reflection, and report these records in writing to the lecturer (this report will also be required to submit as an integral part of the project).	Yes

**Continuous Assessment (%)**

100

**Examination (%)**

0

## Assessment Rubrics (AR)

### Assessment Task

Performance in lecture and workshops

### Criterion

This assessment evaluates students' punctuality, engagement, responsiveness, participation in hands-on activities and exercises, and performance in quizzes. These aspects are essential for fostering a collaborative learning environment and ensuring active involvement in the course.

#### Excellent (A+, A, A-)

Consistently punctual and actively engages in all class discussions and workshops. Exhibits enthusiasm and a proactive approach in hands-on activities, and consistently excels in quizzes.

#### Good (B+, B, B-)

Maintains good punctuality, participates regularly with a clear interest in the subject. Engages reasonably well in hands-on activities and performs well on quizzes.

#### Fair (C+, C, C-)

Occasional lateness or lack of engagement, shows some interest in class activities, and has a basic involvement with hands-on work. Mixed performance in quizzes.

#### Marginal (D)

Frequently late or unengaged, minimal participation in class activities and hands-on exercises. Struggles with quiz content.

#### Failure (F)

Rarely attends on time or engages in class, negligible involvement in exercises and hands-on activities, and consistently poor quiz results.

### Assessment Task

Assignment

### Criterion

This assessment consists of take-home exercises designed to reinforce Python programming skills and apply course concepts independently. Students are encouraged to use AI and other online tools to enhance their code quality and problem-solving techniques, but must document and reflect on their use, submitting a written report as part of the assignment.

#### Excellent (A+, A, A-)

Thoroughly completes all programming exercises with high accuracy and creativity, demonstrating exceptional understanding of Python syntax and logic. Effectively utilizes AI tools, accompanied by a comprehensive and honest reflection report detailing coding processes and insights.

#### Good (B+, B, B-)

Completes programming assignments accurately with some creativity, showing strong command of Python concepts and well-applied solutions using AI tools. The reflection report is well-organized and informative.

#### Fair (C+, C, C-)

Completes most programming tasks with basic accuracy and minimal application of AI tools. Demonstrates a fair understanding of Python principles with some errors, and provides a basic reflection report.

#### Marginal (D)

Programming exercises are incomplete with frequent errors in code syntax or logic, showing limited application of AI tools. The reflection report demonstrates minimal understanding.

**Failure (F)**

Fails to complete programming assignments adequately, lacking use of Python or AI tools, with no meaningful reflection in the report, indicating an inadequate grasp of the material.

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**Assessment Task**

Test

**Criterion**

This closed-book test evaluates students on their understanding of programming and other relevant concepts taught during the course. It assesses their ability to recall and utilize of the knowledge under time constraints.

**Excellent (A+, A, A-)**

Demonstrates an outstanding grasp of all concepts with accurate and comprehensive answers.

**Good (B+, B, B-)**

Shows a solid understanding of concepts with mostly correct answers and minor errors.

**Fair (C+, C, C-)**

Displays a basic comprehension of concepts, with several errors present.

**Marginal (D)**

Shows limited understanding of course material with numerous errors.

**Failure (F)**

Demonstrates little to no understanding of concepts, with pervasive inaccuracies.

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**Assessment Task**

Team Project

**Criterion**

Teams collaboratively develop a program to address a public sector challenge, demonstrating collective application of basic programming skills. The use of AI and online tools is encouraged, and teams must document and reflect on this collaborative process in a report submitted with the project.

**Excellent (A+, A, A-)**

The team develops a clear and effective program that addresses a public sector topic, showcasing competent use of Python concepts and skills and thoughtful integration of AI tools. Team collaboration is evident and effective. The reflection report is comprehensive, providing insights into both the development process and each member's contribution, with careful attention to public sector relevance.

**Good (B+, B, B-)**

The team produces a functional program using basic Python skills to tackle an elementary public sector issue. Displays good team collaboration and understanding in the application of AI tools. The reflection report is well-organized and contextualizes the project within public administration, highlighting collaborative efforts.

**Fair (C+, C, C-)**

The team completes a basic program that functions with some errors, demonstrating satisfactory use of Python and minimal AI tools. The reflection report indicates a basic understanding of the public sector context and mentions contributions from team members.

**Marginal (D)**

The team's program is incomplete or has frequent errors with limited use of Python and AI tools. Team collaboration appears ineffective. The reflection report lacks depth and does not adequately connect the project to public sector challenges or individual team contributions.

#### Failure (F)

The team's program is non-functional, with inadequate use of Python and failure to address a public sector issue. The reflection report is missing or fails to provide insights into the use of AI tools, public sector connection, or teamwork.

## Part III Other Information

### Keyword Syllabus

Python operation, Pandas, NumPy, Matplotlib, StatsModels, Scikit-learn, plotly, Dash, BeautifulSoup, Selenium, Flask, web.py, Pyramid, Pyramid

Statistics, big data, ethics challenge, data analytics for public sector

### Reading List

#### Compulsory Readings

	Title
1	VanderPlas, J. (2023). Python Data Science Handbook. (2nd ed.). O'Reilly Media, Incorporated.

#### Additional Readings

	Title
1	Nelli, F. (2018). Python data analytics#: with Pandas, NumPy, and Matplotlib (Second edition.). Apress.
2	Chen, D. Y. (2018). Pandas for everyone#: Python data analysis. Addison-Wesley.
3	Stepanek, H. (2020). Thinking in Pandas How to Use the Python Data Analysis Library the Right Way (1st ed. 2020.).