PIA3608: DATA ANALYTICS AND VISUALISATION FOR PUBLIC AffAIRS

Effective Term
Semester B 2024/25

Part I Course Overview

Course Title
Data Analytics and Visualisation for Public Affairs

Subject Code
PIA - Public and International Affairs
Course Number
3608

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
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

This course introduces students to the basic skills and techniques of data analytics designed to facilitate evidence-based and data-driven problem solving and decision-making in public affairs. With the use of advanced functions in Excel and other data handling software (for example Python/ R), it will equip students with skills in data preparation, wrangling, organisation, analysis and visualisation. The course will further provide students with techniques in sourcing and acquiring big data and informatics and the skills to communicate with different stakeholders. The use of dashboards for managerial decision-making and popular social media for communication will also be explored. Students in this course will have the chance to polish data analytic and visualisation skills with real-life data and projects. Ethical and social issues related to the use and release of data will be critically evaluated.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Identify the approaches in sourcing, acquiring, and organising data for public affairs.			x	
2	Apply techniques in data management for data preparation and analysis.			x	
3	Prepare data presentation for communicating with stakeholders			x	
4	Distinguish the social and ethical issues in the use of public data		x		
5	Generate new perspectives in looking at public policies in globalised cities				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	Introduce key theories and approaches in data analytics and visualisation	1, 2, 3, 4	
2	Class exercise and assignments	Students acquire the skills in data analytics and visualisation and the use of relevant softwares. They are expected to demonstrate the basic competence in such skills	2, 3	

3	Test	Students should demonstrate their understanding and correct application of theories, approaches and skills in in data analytics and visualisation.	1, 2, 3	
4	Team project	Students are expected to demonstrate their competence in applying in data analytics and visualisation skills in real life data and communicate effectively their findings.	1, 2, 3, 4, 5	
5	Virtual teaching and learning	Students are expected 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 metaverse tools in class and after class to promote the learning and application; 3) document and reflect on the processes using these innovative means, to prepare for sustaining lifelong learning in the information age.	1, 2, 3, 4, 5	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Class exercise and assignments	1, 2, 3	20	In this part, students are allowed to use internet resources, AI tools, metaverse tools 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).

2	Team Project	1, 2, 3, 4, 5	40	In this part, students are allowed to use internet resources, AI tools, metaverse tools 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).
3	Presentation and participation	1, 2, 3	10	
4	Test	1, 2, 3	30	

Continuous Assessment (%)

100

Examination (%)

0

Assessment Rubrics (AR)

Assessment Task

Class exercise and assignments

Criterion

– Identify the approaches in sourcing, acquiring, and organising data for public affairs.
– Apply techniques in data management for data preparation and analysis.

Excellent (A+, A, A-)

Demonstrate excellent ability in– Identify the approaches in sourcing, acquiring, and organising data for public affairs.- Apply techniques in data management for data preparation and analysis.

Good (B+, B, B-)

Demonstrate good ability in - Identify the approaches in sourcing, acquiring, and organising data for public affairs.- Apply techniques in data management for data preparation and analysis.

Fair (C+, C, C-)

Demonstrate adequate ability in - Identify the approaches in sourcing, acquiring, and organising data for public affairs.- Apply techniques in data management for data preparation and analysis.

Marginal (D)

Marginally demonstrate ability in - Identify the approaches in sourcing, acquiring, and organising data for public affairs.- Apply techniques in data management for data preparation and analysis.

Failure (F)

Demonstrate no ability in - Identify the approaches in sourcing, acquiring, and organising data for public affairs.- Apply techniques in data management for data preparation and analysis.

Assessment Task

presentation and participation

Criterion

- Prepare data presentation for communicating with stakeholders

Excellent (A+, A, A-)

Demonstrate excellent ability in- Prepare data presentation for communicating with stakeholders

Good (B+, B, B-)

Demonstrate good ability in- Prepare data presentation for communicating with stakeholders

Fair (C+, C, C-)

Demonstrate adequate ability in- Prepare data presentation for communicating with stakeholders

Marginal (D)

Marginally demonstrate ability in - Prepare data presentation for communicating with stakeholders

Failure (F)

Demonstrate no ability in - Prepare data presentation for communicating with stakeholders

---

Assessment Task

End of term test

Criterion

– Identify the approaches in sourcing, acquiring, and organising data for public affairs.
- Apply techniques in data management for data preparation and analysis.
- Distinguish the social and ethical issues in the use of public data

Excellent (A+, A, A-)

Demonstrate excellent ability in– Identify the approaches in sourcing, acquiring, and organising data for public affairs.- Apply techniques in data management for data preparation and
analysis. Distinguish the social and ethical issues in the use of public data

Good (B+, B, B-)

Demonstrate good ability in – Identify the approaches in sourcing, acquiring, and organising data for public affairs.- Apply techniques in data management for data preparation and analysis. Distinguish the social and ethical issues in the use of public data

Fair (C+, C, C-)

Demonstrate adequate ability in – Identify the approaches in sourcing, acquiring, and organising data for public affairs.- Apply techniques in data management for data preparation and analysis.Distinguish the social and ethical issues in the use of public data

Marginal (D)

Marginally demonstrate ability in– Identify the approaches in sourcing, acquiring, and organising data for public affairs.- Apply techniques in data management for data preparation and analysis. Distinguish the social and ethical issues in the use of public data

Failure (F)

Demonstrate no ability in – Identify the approaches in sourcing, acquiring, and organising data for public affairs.- Apply techniques in data management for data preparation and analysis.Distinguish the social and ethical issues in the use of public data

---

Assessment Task

Team project report

Criterion

-Apply techniques in data management for data preparation and analysis.
-Prepare data presentation for communicating with stakeholders
-Generate new perspectives in looking at public policies in globalised cities

Excellent (A+, A, A-)

Demonstrate excellent ability in Apply techniques in data management for data preparation and analysis.Prepare data presentation for communicating with stakeholders Generate new perspectives in looking at public policies in globalised cities

Good (B+, B, B-)

Demonstrate excellent ability in Apply techniques in data management for data preparation and analysis.Prepare data presentation for communicating with stakeholders Generate new perspectives in looking at public policies in globalised cities

Fair (C+, C, C-)

Demonstrate adequate ability in Apply techniques in data management for data preparation and analysis.Prepare data presentation for communicating with stakeholders Generate new perspectives in looking at public policies in globalised cities

Marginal (D)

Marginally demonstrate ability in Apply techniques in data management for data preparation and analysis.Prepare data presentation for communicating with stakeholders Generate new perspectives in looking at public policies in globalised cities

Failure (F)

Demonstrate no ability in Apply techniques in data management for data preparation and analysis.Prepare data presentation for communicating with stakeholders Generate new perspectives in looking at public policies in globalised cities

---

Part III Other Information

Keyword Syllabus

Evidence and data-driven problem solving and decision making; working with number, big data eco-system; advanced functions in excel; data handling and visualisation software; data sourcing, preparation, wrangling and organisation; basics for data analytics; communicating and story-telling using data; data visualisation; dashboards and basics of database and project management for managerial decision; managing social media for communication; ethical and social issues on big data

Reading List

Compulsory Readings

	Title
1	Ahmed, Mohiuddin and Pathan, Al-Sakib Khan (2019) Data analytics : concepts, techniques, and applications (edition), Boca Raton, FL : CRC Press, Taylor & Francis Group.
2	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.).